JOURNAL
OF THE
AMERICAN VETERINARY MEDICAL ASSOCIATION

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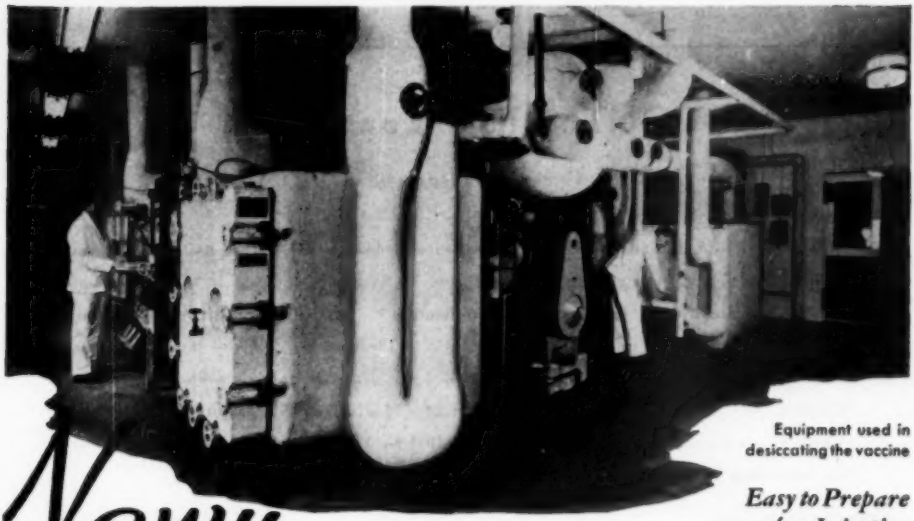

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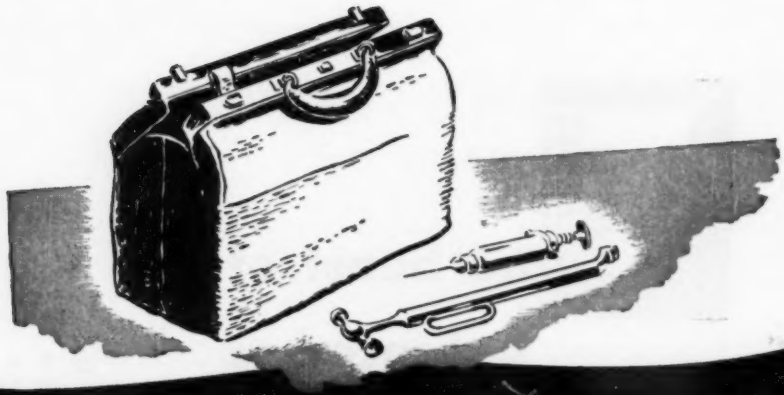

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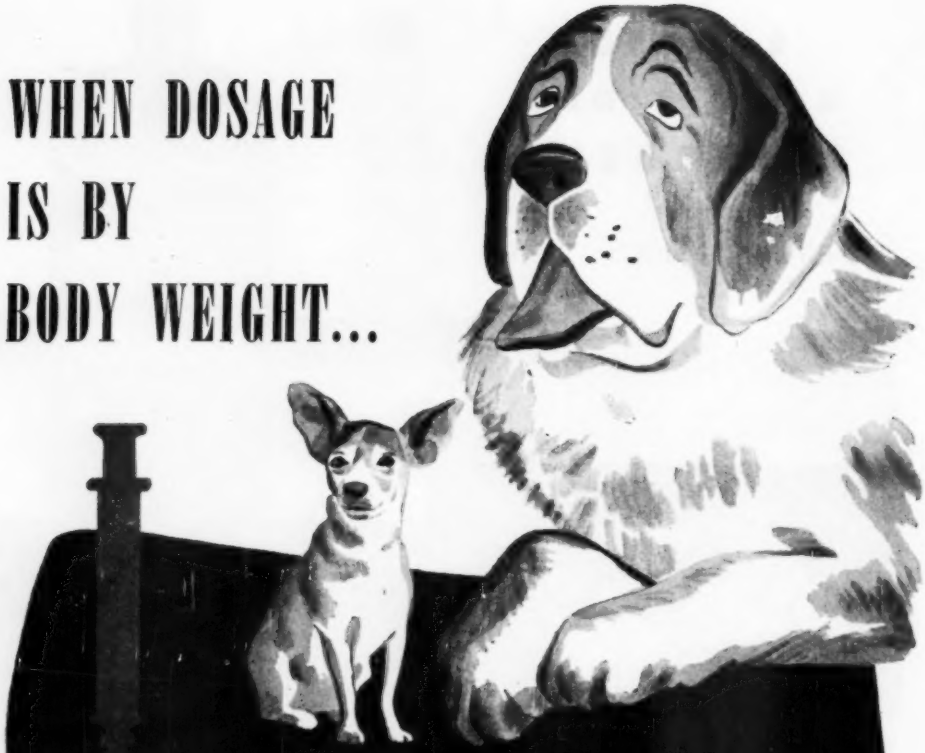

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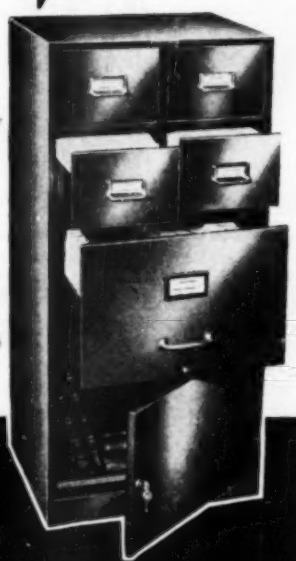

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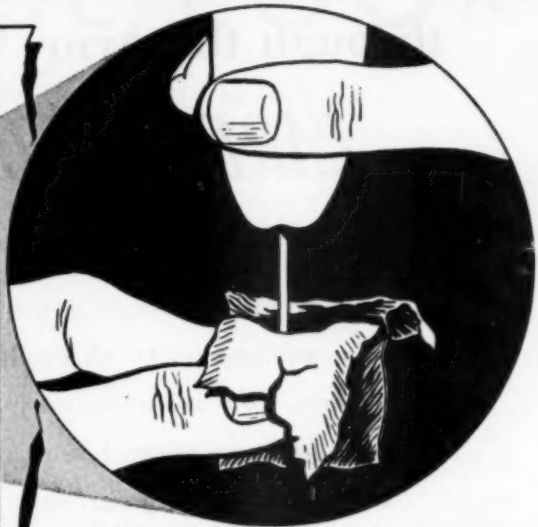

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Veterinary Medical Activities

★ President L. M. Hurt spent a very busy month, carrying the story of AVMA activity and veterinary coöperation to state association meetings in Pennsylvania, Ohio, Oklahoma, Indiana, Iowa, Illinois, and New Jersey.

• • •

★ Executive Board Chairman W. R. Krill filed an official objection to a notice of intention to legalize payment of indemnities to owners of animals condemned for tuberculosis, Johne's disease, and brucellosis upon the basis of tests conducted by non-veterinary technicians. As a result of prompt action by the AVMA, the proposed regulation has been held up. See "News" pages for more information.

• • •

★ "The livestock industry of today would be impossible without veterinary medicine, and our present standard of living would be impossible without the highly organized livestock industry we now have," says an editorial in Baton Rouge *Morning Advocate*, Dec. 14, 1948.

• • •

★ President-elect C. P. Zepp, Sr., attended meetings of the California State Veterinary Medical Association and the Intermountain VMA in Salt Lake City.

• • •

★ "Congratulations A. V. M. A." is the title of an editorial in *Hoard's Dairyman* (Jan. 10, 1949), commenting on the fact that Dr. C. D. Van Houweling has been added to the staff to "promote mutually beneficial relations between the veterinary profession and agricultural interests."

• • •

★ A practitioner writes, "I never read your long-winded articles. Give us more reports of cases, and make them concise." The editor replied, "Your comment is excellent. If you and your practicing colleagues will send the case reports they will be published."

• • •

★ "We will continue to report—as we often have in the past—the fine work of the veterinary profession," the editor of *Time* magazine wrote Executive Secretary J. G. Hardenbergh recently.

• • •

★ "Only a veterinarian, after a careful examination of the dog, can determine accurately whether or not distemper is present" is the gist of a two-page center spread in *Our Dumb Animals* (Jan. 1949), the title of which is "The Distemper Problem."

• • •

★ Members of the AVMA Committee on Motion Pictures reviewed the script and offered their comment on a new strip film titled "Public Health Aspects of Foot-and-Mouth Disease" being prepared by the United States PHS.

• • •

★ Assistant Executive Secretary R. C. Klussendorf attended meetings of the Nebraska, Tennessee, and Mississippi VMA's, and spoke to a group of high school students attending Chicago Area Career Conferences during the holiday vacation.

• • •

★ The Committee on Program is making a top effort to have this year's AVMA Convention in Detroit go down in history as the best yet. More details on the "News" pages.

• • •

★ AVMA Treasurer W. A. Young is the author of "Feline Handling and Restraint" in *North American Veterinarian* (Jan., 1949).

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* *Keeney, E. L. and associates. Bull. Johns Hopkins Hospital 77:422, 1945*

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1. Stults, A. W., and Foley, E. J.: J. Am. Vet. M. A. 113: 68 (July) 1948.

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An Adventure in Anatomy

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IN THE EARLY 1930's, in the College of Medicine at the University of Illinois, Dr. Otto F. Kampmeier inaugurated an integrated course in human anatomy. His purpose was to bring together the three previously disjointed branches of this subject (embryology, histology, gross anatomy), thus forming a single, continuous course. The instruction began with the study of the germ cells, their union in fertilization, the multiplication of cells which occur subsequently, the establishment of the three germ layers and the differentiation of the embryonic cells into the five types of fundamental tissues, together with the genesis of the organs and systems.

As soon as Kampmeier's students had arrived at the place in the course where the embryonic cells begin to take on the form of the basic tissues of the body, he introduced the study of histology and gross anatomy, and from that point on taught embryology, histology, and gross anatomy as a completely integrated unit. He related anatomy to physiology, pathology, medicine, and surgery. Furthermore, he related structures observed on the cadaver to structures on the living body, and introduced clinical cases to emphasize the importance of learning the normal structure. So successful was Kampmeier's undertaking that he has continued that method of teaching for eighteen years, instructing, at times, as many as 180 students each academic year.

In 1943, the writer visited Dr. Kampmeier's classes at Chicago and decided to make an adventure in the teaching of veterinary anatomy by attempting to imitate Kampmeier's system. By degrees, the conventional method of teaching embryology, histology, and gross anatomy was changed until, during the college year 1947-1948, the completely integrated course was instituted at Michigan State College.

Both the students and the staff agree that the venture has been a success. At the end of the year, the students were asked to make a very critical evaluation of the course. Only 1 student in 96 said that he would prefer separate courses in the three subdivisions of anatomy. The success of the undertaking has been due primarily to the fact that, for the most part, the instructors were young and enthusiastic about pioneering in a new method of teaching a subject which some say is "dry as sawdust and dead as a mummy." These instructors, furthermore, have been willing to take on work beyond what is required in the usual courses in anatomy.

ORGANIZATION OF THE COURSE

Part I of the course consists of 14 class sessions dealing with the cell and the early embryonic development of the chick and pig. This study begins with the sex cells and fertilization and follows the story of development by using whole mounts and serial sections of 24-, 48-, and 96-hour chicken embryos and 10 mm., 3-week-old pig embryos.

A class session consists of a fifty-minute lecture, followed by a three-hour laboratory period.

In part I, the student has seen the tissues and organs arise from the three germ layers and has become conscious that cellular composition of body parts varies. This naturally leads, in part II, to the study of the three most widely and abundantly distributed tissues, *i.e.*, the epithelia, the connective tissues (including ligaments, tendons, cartilages, and bones), and skele-

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tal muscle. The study of histology at this point is limited to these three tissues because the dissection of the pectoral limb begins next and these are the first tissues encountered. Eight sessions are spent on these tissues. Since the skin is the first structure to be examined on the carcass, and since most of the cellular elements of which it is composed have just been studied, the skin as a whole is the first and only organ to be studied histologically in part II.

Part III, the skeleton, has five sessions allotted to it. In the conventional courses in anatomy, osteology is usually taught separately. In this integrated course, bones are constantly considered in relation to other structures and, consequently, in these class periods only the general features of the skeleton are studied. The special features of individual bones are considered later.

In part IV, the actual dissection begins. The dog is used as the type animal, since it is ideal for a rapid survey of gross anatomy, is cheap, and is fairly easily procured. Two students share an animal. Miller's "Guide to the Dissection of the Dog" is required and is very satisfactory. The ten periods allotted to part IV are devoted to the superficial structures of the thorax, and the muscles and joints of the pectoral limb.

Part V is devoted to the pelvic limb. Six sessions are adequate because the students have already gained some experience in dissecting on the pectoral limb and naturally do the pelvic limb with greater facility.

At Michigan State College, the 43 sessions already spent on the course carry us to Thanksgiving vacation. This is a convenient point to discontinue the dissection and put the dogs in preserving solution until the beginning of the winter quarter. The intervening seven class periods are given to the study of the embryology, histology, and organization of the nervous system which constitutes part VI. This section includes a gross study of brains obtained from an abattoir. The work for the quarter is terminated by two periods dealing with disturbances of development (anomalies and monsters), which ties in well with the knowledge the student already has of normal development.

Miller's method for dissecting the dog calls for a study of the muscles, bones, and joints on the right side of the animal and a study of blood vessels and nerves on the left side by a repetition of the dissection. This duplication of dissection is very satisfactory in the integrated course. It helps to fix the knowledge already acquired and introduces two new subjects in gross anatomy, *i.e.*, nerves and blood vessels. The embryology and histology of nerves have already been covered in part VI. It remains then to study the blood, blood-forming, and blood-conducting organs at this point. Four periods are allowed for this (part VII). In this section, the specific things considered are the embryology and histology of blood, bone marrow, lymph nodes, and thymus, and the blood and lymph vessels.

In part VIII (13 sessions), dissection is resumed. The left thoracic and abdominal wall and the thoracic contents are studied, followed by the vessels and nerves of the left pectoral limb. Two of the 13 sessions are used for microscopic study of the heart and lungs.

In the 19 periods of part IX, the abdominal and pelvic organs are studied; 11 sessions are spent on microscopic and eight on gross study.

Part X, three periods, is a gross study of the vessels and nerves of the pelvic limb. A more detailed study of the limbs is made in the spring quarter in comparative anatomy, when the limbs of the horse are studied.

The integrated course concludes with part XI, which is a study of the embryology, and the microscopic and gross structure of the organs of the head and neck. The nine periods allotted, five to dissection and four to the microscopic work, are hardly sufficient.

The 96 students who enrolled for the course were divided into three sections of 32 each. Two instructors were assigned to each section. They were paired, so that each section had one person who was especially qualified to teach embryology and histology, and the other one gross anatomy. The pairings this year to inaugurate the course were Drs. H. E. Johnson and R. A. Runnells, M. Lois Calhoun and A. H. Safanie, and J. F. Smithcors and G. E. Braunschneider. The staff has found the integrated course to be much more interesting and stimulating to teach than the conventional course. It also requires a much broader knowledge of anatomy by the instructors so that they may convey this wider knowledge to the students.

Actually, the integration theme is carried even farther than the mere combination of the three units of anatomy. Wherever possible, structure is correlated with its functional, pathologic, and clinical significance. Rote memorization is reduced to a minimum; instead, the student is encouraged to learn by a process of association.

Q Fever — A Brief Survey of the Problem

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Q fever is a rickettsial disease resident in nature and communicable to various domestic animals and to man. Its existence in nature was first shown in the spring of 1935 by Davis,[1] who recovered the original North American strain from specimens of the Rocky Mountain wood tick, *D. andersoni*, collected near Nine Mile, Mont. The name "Nine Mile fever" was first used to designate this new disease. That same year Derrick,[2] in Australia, initiated studies of a diseases of which occasional cases had been observed in slaughterhouse workers at Brisbane, Queensland, since the spring of 1933. This disease was given the name "Q fever." Relationship to the North American disease was first suggested by Dyer[3] in 1938, and identity was subsequently fully established by studies by Dyer[4] and Bengtson[5] in this country and by Burnet and Freeman[6, 7] in Australia. For several years, pending certainty on this point, the diseases in the two countries were often referred to as "American Q fever" and "Australian Q fever."

The Infectious Agent

The infectious agent is a Rickettsia, *C. burneti*. The placing of this species in a separate genus[8, 9] is justified by its filterability, a characteristic not shared by species of the genus Rickettsia. The specific name "burneti" proposed by Derrick[10] in 1939 has precedence over the more descriptive name "diaporica" proposed by Cox[11] a few months later.

This Rickettsia is readily stained with Giemsa and by the Macchiavello method. It readily passes Berkfeld N and W filters.[1] It grows abundantly in the yolk sac of developing chicken embryos and can also be grown in tissue culture. However, yolk-sac suspensions are much the more infectious. This Rickettsia can be identified serologically by complement fixation and rickettsial agglutination tests, the former being preferred. The guinea pig is the most satisfactory laboratory animal for testing blood, tissues, and other materials for infectiousness. It exhibits typical gross lesions of the spleen, and animals injected subcutaneously with strains of the usual virulence exhibit a characteristic nonsuppurative subcutaneous lesion in which the rickettsiae are commonly abundant.

An interesting quality of *C. burneti* is its resistance to environmental conditions. Infected tick (*D. andersoni*) feces retain their infectiousness for long periods; just how long has not been determined. Philip[12] has found feces stored at room temperature for 586 days still infectious, and feces similarly stored for nearly six years still showed recognizable rickettsiae when examined microscopically, exhibited antigenicity in serologic tests, and immunized injected guinea pigs, but a strain was not recovered. Infected guinea-pig blood, dried and stored at room temperature, was found still infectious when last tested 182 days later, dried guinea-pig urine was infectious on the 49th day, and thoroughly dried ticks (*Rhipicephalus sanguineus*) were still highly infectious on the 45th day.[13]

Due to discoveries made during and subsequent to World War II, Q fever is now known to be endemic on five continents —North America, Australia, Europe, Africa, and Asia. World-wide distribution appears a definite possibility.

North America

In North America it is endemic in the United States and in Panama.

United States.—In the United States it has been reported in nature, in cattle, and in man. Definite knowledge of its occurrence in nature is limited to ticks. Since its original recovery from *D. andersoni* in 1935,[1] the Rickettsia has been recovered several times from this species in the Bitter Root Valley, Mont., and, in 1938, three strains were recovered from ticks collected from two areas in Laramie County, Wyo.[14] From *D. occidentalis*, strains have been recovered as follows: two in 1935 from engorged nymphs collected in Josephine County, Ore.;[15] three in 1937 from adult ticks collected in Orange and Ventura counties, Calif.;[16] and during the past several months three strains from adults collected in Los Angeles County, Calif. (Jellison, Bell, and Parker, unpublished data.) From *A. americanum*, Parker and Kohls[16] have reported the recovery of *C. burneti* from 10 of 92 lots of nymphs and adults collected in 1937 in Liberty County, Texas. Two of these infected lots were collected from

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goats, two from cows, and one from dogs. Numerous strains were recovered in 1943 and 1944 by Parker and Steinhaus[12] from lots totaling some 15,000 adult ticks from Camp Bullis, Texas. Most of these strains were mild. In 1939 and 1940, Parker, Bell, and Chalgren (unpublished data), incident to tests of ticks of the eastern United States for infectious agents, recovered this Rickettsia from two lots of *Ioxides dentatus* from Prince George County, Va., from three lots from Suffolk County, N. Y., and from one lot of *Haemaphysalis leporis-palustris* from Prince George County, Va. These ticks were all collected from rabbits. In 1947 and 1948, Jellison, Bell, Huebner, Parker, and Welsh (in press) recovered ten strains from the spinose ear tick, *Otobius megnini*, collected from dairy cattle in southern California.

Experimentally, stage-to-stage survival, transmission by feeding, and transovarial transmission have been shown in *D. andersoni* by Parker and Davis.[17] The tissues of infected ticks of this species may contain 500,000,000,000 infectious doses per gram and the feces 500,000,000. The infected feces can cause infection through the unabraded or abraded skin of guinea pigs and *via* the conjunctivae, nostrils, and mouth.[12]

Philip (unpublished data) has transmitted the Rickettsia to guinea pigs experimentally with the cosmopolitan brown dog tick, *R. sanguineus*.

Among soft-shelled ticks other than *Otobius megnini*, Davis[18] has shown *Ornithodorus hermsi*, a vector of relapsing fever in six western states, to be an excellent experimental vector of Q fever. Ticks of this species transmitted infection up to 772 days after the infective feeding, and persistence in the tissues was shown up to 979 days. In *Ornithodorus turicata*, another vector of relapsing fever, he demonstrated survival of the Rickettsia in the tissues for 1,001 days but was unable to obtain transmission by bite or transovarially.

Philip[12] has recovered the Rickettsia from houseflies collected at the Rocky Mountain Laboratory in a room in which there were Q-fever-infected guinea pigs, but was unable to transfer infection experimentally from infected guinea pigs to normal animals kept separately in a common cage, houseflies having access to both groups. In more recent studies, *C. burneti* was recovered from housefly maggots breeding in the bedding material in a can containing infected guinea pigs. This investigator was unable to transmit the Rickettsia by mosquitoes (*Aedes aegypti*).[12]

Knowledge of which species of our native animals become spontaneously infected is essentially nil, but it is natural to suspect animals that are hosts of ticks. A survey of wild animal serums by means of the complement fixation test was initiated in early 1947 at the Rocky Mountain Laboratory in an attempt to obtain information on this subject. Several hundred serums were tested but the results were obscured by nonspecific reactions. The only apparently reliable positive test was obtained with a serum specimen from a porcupine.

Experimentally,[12] the following animals have been found susceptible: field mouse, Microtus sp.; whitefooted mouse, *Peromyscus maniculatus artemisae;* house mouse, *Mus musculus;* porcupine, *Erethizon epixanthum epixanthum;* chipmunk, Eutamias sp.; pine squirrel, *Sciurus hudsonicus richardsoni;* flying squirrel, *Glaucomys sabrinus bangsi;* mountain rat, *Neotoma cinerea cinerea;* cottontail rabbit, *Sylvilagus nuttallii;* sparrow, *Passer domesticus domesticus;* and pigeon, *Columba livia*.

Among the domestic animals, so far as reported, spontaneous infection has thus far been demonstrated only in cattle but, in view of findings reported in other countries, it is justifiable to suspect that it may occur to some extent in goats, sheep, horses, mules, and, possibly, occasionally in dogs and cats. In 1939, 3 sheep were experimentally inoculated at the Rocky Mountain Laboratory, 1 intraperitoneally, another subcutaneously, and the third intranasally. The Rickettsia was recovered from the blood of the first 2 (during the first week) but not from that of the third. It was also recovered from the blood of a dog (third day) inoculated subcutaneously at the same time. In 1940, it was recovered from the liver of a domestic chicken inoculated intraperitoneally and from the spleen of another inoculated subcutaneously, and, in quite recent tests, from the blood, spleen, liver, ovaries, kidneys, and testes of chickens inoculated intravenously. Among cage birds, parakeets have been found susceptible—apparently highly so.[13]

Parker and Steinhaus,[19] during an observation period of 120 days, have reported the persistence of the Rickettsia in the tissues of guinea pigs for some time after defervescence. It was recovered from the liver up to the 60th day, from the testes up to the 50th day, from the seminal vesicles up to the 100th day, and from the kidneys and spleen up to the 120th day. It was also recovered from the urine up to the 100th day.

Only within the past 2 years has it become apparent that Q fever is an important disease of man in the United States. This has become evident as the result of: (1) an outbreak in March, 1946, of 55 cases (2 deaths) among stock handlers and slaughterhouse workers in Amarillo, Texas;[20] (2) an outbreak in August,

1946, of 33 cases (no deaths) among workers on a killing and dressing floor of a Chicago packing house;[21] and (3) of the occurrence since 1946 of numerous cases in southern California.

Aside from the outbreaks just cited, only 4 endemic cases have been reported in the United States since 1935, except among laboratory workers. Three of these cases were in western Montana in 1939, 1940, and 1947, respectively. In the fourth case, reported from South Carolina in 1941, it is doubtful if the diagnosis of Q fever was justified.

There have been three major outbreaks of Q fever among laboratory workers in this country—two at the National Institute of Health, Bethesda, Md., and one at the laboratory of the Army Commission on Acute Respiratory Diseases, Fort Bragg, S. Car. In the first outbreak[22] at the National Institute of Health in 1940, there were 15 cases (1 death) and in the second[23] in 1946, there were 47 cases. During the Fort Bragg outbreak[24] in 1945, there were 16 cases. Sporadic cases have occurred in other laboratories.

Panama.—The only information relative to Q fever in Panama relates to the diagnosis of 2 cases in 1945.[25, 26]

AUSTRALIA

Queensland.—Q fever was first definitely recognized as a disease entity of man in Queensland in 1935.[2] The disease is particularly prevalent in the southeastern portion of the state.

The only parasite found spontaneously infected is the tick, *Haemophysalis humerosa*. Derrick and Smith[27] have reported isolation of six strains from ticks of this species collected from bandicoots *(Isoödon torosus)* on Moreton Island. This tick also infests rats and occasionally cattle. It is considered an important factor in the natural maintenance of Q fever. Smith[28] has shown experimental transmission to guinea pigs by this tick and by three Australian species, *Haemophysalis bispinosa*,[29] *I. holocyclus*,[30] and the brown dog tick, *R. sanguineus*.[30] Another tick, an argasid, *Orinthodorus gurneyi*, failed to transmit infection, but the Rickettsia survived in its tissue without loss of virulence for 538 days.[29] Still another species, the cattle tick, *B. microplus*, became infected when feeding on an experimentally infected calf.[32] The excrement of *B. microplus*,[32] *H. humerosa*, and *R. sanguineus*[33] was found infectious, and feces were shown to infect guinea pigs when applied to the abraded or unabraded skin. One gram of *R. sanguineus* excrement was found to contain 100,000,000 guinea-pig infectious doses sixty-five days after collection. Transovarial transmission of *C. burneti* was not demonstrated in any of these ticks, but was suggested in the experimental studies with *H. humerosa*.

Other species of ticks than those mentioned above, and various species of sucking lice, fleas, mites, and two species of parasitic flies (including the sheep tick, *Melophagus ovinus*) have been tested for spontaneous infection with negative results.[34]

Tests for transmission by the cat flea, *Ctenocephalides felis*, were negative;[35] also, tests with the tropical fowl mite, *Lyponyssus bursa*.[34]

Of the native animals of Queensland, the bandicoot is the only one from which strains of *C. burneti* have been recovered. Derrick and Smith[27] recovered strains from tissues of 3 of 109 bandicoots tested in 1940. Two of these bandicoots were from Moreton Island, 1 from the mainland. Their serums also agglutinated *C. burneti*. Experimental infection in the bandicoot is inapparent.[34] Freeman[36] reported 39 of 180 bandicoot serums positive by the agglutination test; also the serums of 2 water rats *(Hydromys derysogater)*, and 1 of another rat *(Rattus culmorum youngi)*. Positive tests have also been reported with the serum of an opossum *(Trichosiorus vulpecula)* and of a rat kangaroo *(Aepyprymmus refescues)*.[34]

The epidemiologic evidence with respect to human infection in Queensland has pointed strongly toward cattle as the most important source and hence to the assumption that cattle were susceptible. This assumption was supported by positive agglutination tests with cattle serums and by the apparently successful inoculation of 2 calves.[32]

An attempt to infect 2 sheep and 2 pigs yielded no significant positive findings.[34]

Two fox terriers were inoculated (route?).[37] Both became febrile on the 3rd day for one and three days, respectively. There was some abdominal tenderness and also loss of appetite and energy. One, sacrificed on the 5th day, exhibited a slightly enlarged spleen and its blood was infectious. The second was splenectomized on the 31st day and sacrificed on the 45th day. Tissues and interval blood specimens did not infect guinea pigs. It was concluded that the dog is susceptible.

Between the fall of 1935 and that of 1944, 217 cases of Q fever in man had been diagnosed in southeast Queensland and 1 from North Queensland.[38] There is no available record of the total of subsequent cases. The majority of cases have been reported in slaughterhouse workers, others in farmers, persons working on farms, and forestry personnel. There have been at least 7 cases among laboratory workers.

Derrick, Smith, and Brown[39] have suggested a basic cycle in nature involving the bandicoot

and probably other native animals with *H. humerosa* and *I. holocyclus* as vectors. From this natural complex, the latter tick could infect man. They also suggest a secondary cycle resulting from the infecting of cattle by *I. holocyclus* and that infected tick feces from the hides of cattle may be present as dust in the air and, by inhalation, be a likely source of infection of abattoir workers.

South Australia.—In correspondence, Dr. R. V. Southcott, of Unley, South Australia, has advised of the recent occurrence of some 10 cases of Q fever among abattoir workers at Adelaide, cattle from Queensland being the apparent source of infection.

EUROPE

Rapidly accumulating evidence suggests widespread occurrence of the disease in Europe.

Greece.—Caminopetros[39] has made rather extensive observations on experimentally infected domestic animals. He reports having infected sheep and goats by subcutaneous inoculation, by nasal instillation, *via* the conjunctiva, and by inoculation into the lung. Following an incubation period of six days or longer, there was a marked febrile reaction. In sheep inoculated subcutaneously, there was extensive inflammation at the site of injection. Animals inoculated *via* the nostrils developed bronchopneumonia with a dry cough and dyspnea. In some instances, there was also a nasal catarrh, most productive in sheep, and nasal exudate from a goat thus affected was infectious for guinea pigs. In 2 goats there were coarse râles and consolidation. One goat (a kid) died two days after becoming afebrile. Its spleen was much enlarged and adherent, and there was increased pericardial fluid. A ram, which was severely ill, showed marked weakness after the febrile period and two months later developed a paraplegia of the rear quarters with resultant death in about six months. Blood from the sheep and goats was infectious for guinea pigs but urine was always negative. Milk was found infectious during the whole lactation period and, after pregnancy, reappeared in the milk of infected animals, and resultant infection in offspring is claimed. It is stated that while infectious milk remained so under refrigeration, it became noninfectious when allowed to sour.

The demonstration of spontaneous infection in sheep and goats in 1947 and early 1948 is reported.

Horses and mules were infected *via* the conjunctiva, which became extensively inflamed. There was high fever of six to ten days' duration. The blood was infectious but the complement fixation test was negative.

Young dogs and kittens were inoculated, some subcutaneously and some *via* the conjunctiva. The dogs had brief febrile periods, while the kittens remained afebrile. The blood of both the dogs and the kittens was noninfectious, but the complement fixation test was reported positive.

The same investigator states that the first recognized human cases in Greece occurred in 1941 among German troops. From them, two years later, he established strains, one strain of which was later sent to the United States where the infectious agent was identified as a Rickettsia similar to that of Q fever by Dr. John H. Dingle, director of the laboratory of the Commission for Respiratory Diseases.

Robbins, Gauld, and Warner[40] report 40 cases in 1945 in a British parachute regiment during and after evacuation from Greece (Athens).

Caminopetros also reports some 50 cases during the first six months of 1947 among British troops stationed at Athens and Salonika, and during the same period numerous cases occurred among Greek civilians and attending physicians and nurses. He considers sheep and goat milk and infectious human sputum as likely sources of human infection.

Italy and Corsica.—The first definite knowledge of Q fever in Italy and Corsica resulted from the occurrence of six spontaneous outbreaks in Italy in 1944 and 1945 and one in Corsica in 1944 among American military units.[40] Eighty-five cases were reported in Corsica and nearly 500 in Italy. In addition, there were 20 cases in 1945 among personnel of the 15th Medical General Laboratory at Naples.[41] Still other cases originating at the Grottaglie Air Base in southern Italy, in 1945, were treated and diagnosed after arrival in the United States. In 1947, a Boston merchant became ill with Q fever while en route home from a business trip to Europe. Infection was supposed to have been contracted in the vicinity of Naples.[42]

Cases occurring among British troops in Italy in 1945 have been reported by Adams, Staveley, Rolleston, Henley, and Caughey,[43] and Caughey and Dudgeon.[44]

Most of the outbreaks in Italy were reported as occurring incident to association with animals. Air-borne infection by dust contaminated by animal or insect feces was considered a possible source.[45]

Switzerland.—The recognition of Q fever in northern and western Switzerland in 1947 has been reported in two papers by Gsell.[46, 47] The cases occurred in the cantons of St. Gall and Zürich and in Geneva. It is of interest that the first 4 cases diagnosed were members of a family of 5 and that all became ill within a three-day period, and that during June there was an outbreak of 30 cases in a boarding school.

Other European Countries. — There are reports dating back to 1941 suggestive or indicative of the occurrence of Q fever in other European countries: Bulgaria, Rumania, and Serbia of the Balkans and in the Crimea in Russia. The recovery of five apparently authentic strains from Rumanian patients in early 1947 has been reported by Combiesco *et al.*[48] In the spring of 1948, 3 cases were diagnosed in Portugal (verbal information from Dr. F. J. Cambournac, Institute of Tropical Medicine, Lisbon) and information recently received by correspondence suggests its occurrence in Spain, Belgium, and Germany.

AFRICA

Morocco. — In 1946, Blanc,, Martin, and Maurice[49] reported the recovery of *C. burneti* from a pool of *Hyalomma savignyi* collected from the ground in the vicinity of gerbil *(Mériones shawi)* burrows near Goulimine in southern Morocco. Subsequently, Dr. Blanc and his associates[50-52] have recovered seven more strains from the same locality, two from pools of gerbil spleens, three from pools of Hyalomma from sheep and goats, one from a pool of Hyalomma from cattle and camels, and one from a pool of *Hyalomma dromedarii* from a camel (dromedary), and four strains more from other parts of Morocco, one from Hyalomma taken from a camel at Agdz, one from Hyalomma from a heifer at Casablanca, one from *Hylomma excavatum lusitanicum* found on the ground near gerbil burrows, and one from Hyalomma from a donkey.

These investigators have further shown that *C. burneti* persists in ticks, *R. sanguineus* and *Ornithodorus erraticus* allowed to feed on experimental animals[50] and that there is transovarial transmission of the Rickettsia in a species of Hyalomma, the specific name of which is not given.[52] They also report the inoculation of goats, sheep, cattle, and a camel with resultant febrile reaction and the appearance of specific antibodies in their blood, and that the following native rodents have been found susceptible experimentally: two species of rats *(Rattus rattus ater* and *R. r. frugivorus)*, two species of gerbils *(Dipodillus campestris riparius* and *Mériones shawi)*, and other animals (in correspondence) designated as mouse, squirrel, hedgehog, and an insectivore.

The opinion is expressed[52] that in Morocco *C. burneti* is primarily a parasite of ticks of the genus Hyalomma, that its perpetuation is assured by transovarial transmission in these ticks, and that spontaneously infected vertebrates play only an accessory rôle in perpetuating the Rickettsia.

No human cases have thus far been reported.

Algeria.—Dr. Blanc has stated, in correspondence with one of the authors, that 2 human cases have been recently diagnosed in Algeria.

Other data.—The African soft-shell tick, *Ornithodorus moubata*, (the tampan tick) prevalent in southern and central Africa, has been shown by Davis[53] to be an excellent experimental vector, and transovarial transmission has been demonstrated to the second generation.

ASIA

India. — In the report[54] "Scrub Typhus Investigations in S. E. Asia," published in 1947, it is stated in Appendix 17 that at a medical specialists' conference at Lahore in 1944 "Lt. Col. Pasricha reported 400 cases of Q fever in Dehra Dun." The diagnosis was based on clinical features and "highly suggestive results reported on the serums of these patients by Burnet." However, the authors further state that their findings in laboratory animals were atypical.

Turkey.—Caminopetros[55] mentions serologic evidence suggestive of the occurrence of Q fever in goats in Turkey.

Payzin and Golem,[56] of the Institut Central d'Hygiene, Ankara, have recently reported the recovery of strains of *C. burneti* from 5 patients in eastern and central Turkey. Some of these strains have been established at the Rocky Mountain Laboratory. In correspondence, Dr. Golem has mentioned the occurrence of infections in laboratory personnel.

Iraq.—Beattie[25] has reported a case of Q fever in a British surgeon serving in Iraq in 1945.

Q Fever in California. — Endemicity of Q fever in California was first indicated by the recovery of *Coxiella burneti* from the Pacific Coast tick, *Dermacentor occidentalis*, in 1937.[15] Infection in man was first suspected by Dr. Frank W. Young in Artesia in 1947.[56] His suspicion was verified by complement fixation tests made at the National Institute of Health. Dr. Young suggested that infectious air-borne dust from local dairies might be the source of infection.

Studies in the milkshed area of Los Angeles County were immediately undertaken by the National Institute of Health. Initial observations resulted in the diagnosis of more human cases and in obtaining serologic evidence (1) that Q fever occurred commonly among cows and (2) that proximity to dairies, by reason of occupation or residence, was a factor in more than 50 per cent of the human cases.[57] These findings led to more intensive studies, which are still in progress, and in which the California State Health Department, the California State Department of Agriculture, and the Los Angeles City and County Health Departments have been coöperating under the over-all direction

of Dr. R. J. Huebner, of the National Institute of Health. A field laboratory was established at Hondo in September, 1947. The intensive subsequent studies of Q fever in man and cattle have resulted in the accumulation of a large volume of pertinent epidemiologic information. This information has served to emphasize the scantiness of our knowledge of Q fever, not only in relation to man and to the cattle and dairy industries but also in nature. The early publications on the work of this laboratory[58,59] report: (1) the recovery of *C. burneti* from the raw milk of local dairies (the first evidence that the milk of infected cows is infectious); (2) that initial tests have indicated that the high-temperature, short-time method of pasteurization is effective in rendering contaminated milk noninfectious for guinea pigs, but results with the vat method have been less definite; and (3) that the considerable number of cases among dairy, stockyard, and packinghouse workers in Los Angeles County emphasizes the importance of contact with livestock as a means of infection.

More recently, studies of Q fever in northern California have been undertaken by the Virus and Rickettsial Disease Laboratory of the California State Department of Health at Berkeley with important, but as yet unpublished, findings relative to the occurrence of Q fever in other domestic animals and in man.

(To be continued)

Phosphorus Deficient Soil

At the present, farmers throughout Ontario are being encouraged to have their soil analyzed. The common explanation for supplementing specific elements through commercial fertilizers is that more luxurious crops may be obtained. Seldom does the layman go one step further and consider the possible effects of soil deficiences on the livestock raised on premises where there is a deficiency of essential elements.

In October, 1947, I was called to investigate a herd in eastern Ontario. The history was that the cattle on the premises became progressively thinner throughout the summer months and showed varying degrees of diarrhea. When examined in October, 1947, the herd, and more particularly the first-calf heifers, were so emaciated as to be in a pitiable state. The calves and the more mature cows were not severely affected.

A detailed clinical examination of several of the heifers failed to reveal any specific cause for their condition. They did, however, manifest listlessness, lack of growth, and pica, especially for salt which increased thirst and aggravated the diarrhea.

A walk over the farm revealed that it was low and marshy. Drainage was inadequate and the owner volunteered that during the spring months much of the farm was under water. It was suggested that soil samples be submitted for analysis.

The following comment accompanied the report from the soil specialist:

> The report shows a definite lack of phosphorus in the surface soil. Some of the subsoil samples are well supplied with phosphorus.
>
> It is my belief that if this soil were properly drained and he could get some of the deeper rooted legumes to grow they would make use of the phosphorus in the subsoil and would produce better feed from the phosphorus standpoint for his cattle.
>
> To my mind, drainage is essential and until he gets better drainage he can not expect to get full use of the minerals his soil contains.

Phosphorus-rich foods such as wheat, barley, oats, and cottonseed meal and the use of a carefully chosen mineral supplement was advised and, to date, the cattle are in satisfactory condition. However, in this instance the circumstances are such and the deficiency so great that it may prove impractical to maintain this farm for dairying.—*Eric F. Pallister, D.V.M., Fort Collins, Colo.*

The Foot-and-Mouth Disease Situation in Mexico

The northernmost point on the foot-and-mouth disease quarantine line in Mexico was 367 miles away from the United States border as 1948 drew to a close. And as 1949 opened, Mexican laboratories were gearing to produce up to 2½ million doses of vaccine a month, with the prospect that synchronized action by field forces will allow nearly the total output to be used on susceptible animals. There are 7½ to 12 million such animals in the infected zone, and it is planned to vaccinate each one twice a year. The field forces are being enlarged gradually to carry out this ambitious schedule. At present, the complete staff comprises about 3,000, including approximately 500 United States employees.

No nation, not even America, has ever produced enough of the right kinds of foods to meet the needs of adequate nutrition for its entire population.—*Nutr. Rev., April, 1948.*

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Wound Infections

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EVEN though readers of the JOURNAL of the AVMA may consider it elementary, I shall define a few of the terms used in this paper, to wit: A *wound* is a break in the continuity of tissue by an external instrument. A *contaminated wound* contains organisms, but a sufficient time has not elapsed for the body tissues to destroy the bacteria nor for an infection to develop. An *infected wound* implies previous contamination in which sufficient time has elapsed for the invasion of the tissues with bacteria and the manifestations of infection.

PHYSIOLOGIC REPAIR

The normal repair of tissue is stimulated by the injury to the tissues whether the injury is an operating-room incision or an accident. In careless surgery or in accidental wounds, the injury may have been severe, producing over-stimulation with resultant exuberant granulation (proud flesh). The injured cells liberate a tissue extract or chemical substance which probably is chiefly responsible for the fibroplastic response from the adjacent tissue. The usual symptoms of inflammation follow: increased blood supply to the part, increased permeability of the capillaries, and migration of leucocytes through the endothelium. A clot quickly fills in the space between the injured tissues. A fibrin framework forms in the clot for the future repair. In a small, clean incision, the clot is small and the repair, either by regeneration of the injured tissues or by the production of scar tissue, is rapid. The presence of foreign bodies, of infection, or movement of the part may retard the healing process by disturbing the delicate fibrin network.

There are many other factors that seriously retard healing. Usually, young patients heal more rapidly than old ones. Well-nourished patients heal faster than malnourished ones. The blood supply of the area is important. Highly vascular tissues heal quicker than do less vascular tissues. Tissues to which the blood supply has been lessened by injury, by tourniquets, or by tight bandages are retarded in the healing process. Retarded healing is observed in patients deficient in vitamin C. Some workers have observed that the application of vitamins A and D to wounds has stimulated healing; others are of the opinion that vitamin A and D levels have no bearing on wound healing, but, if used, they should be used systemically rather than locally. There is no doubt that protein deficiencies have a direct bearing on wound healing. Protein is necessary for rapid wound healing—a high protein diet stimulates fibroplasia. Since wound repair is stimulated by acidosis and slowed down by alkalosis, the optimum in fluid intake and electrolytic balance should be insured. Immobilization of a wound prevents destruction of the new delicate tissue. Careful suturing immobilizes the injured tissues and holds them in position during repair. However, in an effort to immobilize the parts and to reduce the dead space, one should not place sutures in such a manner as to reduce the blood supply and cause necrosis.

Ideally, quick healing is by primary union without infection. Most operating-room wounds, some field surgery, and a few traumatic wounds heal by first intention following careful aseptic technique. First, the blood and serum exude into the space, coagulate on a fibrin network, and squeeze out a small amount of serum which may come to the surface to form a protective scab. Second, three to four days later, fibroplasia begins — the fibroblasts divide and grow into and absorb the coagulum. Vascularization is reëstablished by the budding of the capillaries. The new tissue, called granulation tissue, reëstablishes the continuity of the injured tissue. At first, the

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granulation tissue is weak but it rapidly grows stronger—a fact that bears directly on when the sutures should be removed and upon the activity permitted the patient. The healed wound will never be as strong as the normal tissue. Finally, the scar tissue contracts for an indefinite period of time. Epithelium covers the repair, and the site of the injury can be located only by histologic examination.

When conditions are not optimum for healing by primary union, healing by the formation of granulation tissue (second intention) may be the only alternative. If there is severe destruction of tissue, extensive gaping of the wound, or if the wound is infected, it is impossible to obtain first intention healing; in fact, it is usually contraindicated to close the wound. First, there is a cleansing of the wound by the outpouring of exudate made up of serum, lymph, leucocytes, and tissue debris. Next, the wound is filled by granulation tissue and the epithelium grows over the granulation tissue. In this type of healing, the scar will be larger, the repair will be weaker, and the time required will be relatively much longer. If there is an extensive area of granulation, the epithelium may grow in for some distance and then stop (regeneration fatigue). The edges of the epithelium should be stimulated by scarification or by the application of irritants, none of which should come in contact with the delicate granulation tissue beneath.

Occasionally, it is desirable to allow a wound to heal as an open wound until the cleansing process has been completed, until there is practically no exudate from it, and it is relatively free from bacteria, at which time the edges are brought into apposition by secondary sutures.

Bacteriology of Wounds

The term "sterile surgery" is a misnomer. All open wounds are contaminated. The elaborate and exacting operating-room technique in vogue today can only minimize, not eliminate, the contamination. If the contamination of the wound is slight, the natural defense mechanisms of the body may overcome the bacteria present and a sterile wound result. Contamination is a relative proposition: A heavily contaminated wound may become sterile under the most favorable conditions while a lightly contaminated wound may become infected under less favorable conditions. In the operating room, we can only approach sterility. Contamination from the skin of the patient may be reduced by proper preparation of the site of the operation. Contamination of the open wound by organisms from the nose and throat of the operating-room personnel is not pertinent in veterinary practice. Sterility of the bare-handed surgeon cannot be absolute. The contamination from the air of the room can be reduced by proper construction and management but not wholly eliminated. Instruments, drapes, sponges, etc., can be rendered sterile by careful attention to detail. The degree of contamination present in traumatic wounds is dependent directly upon the conditions under which the wound was sustained. Wounds about the feet and legs of farm animals are usually more grossly contaminated than wounds on the body. If soil, manure, or other debris is present in the wound, the contamination is certain to be heavy. Generally speaking, wounds of less than six hours' duration are contaminated; those of from six to twelve hours' duration may be contaminated or infected; and those of twelve or more hours' duration are infected. For the first five days, the wound is susceptible to both local and systemic infections. After granulation tissue has formed, the danger of infection is nil. Healthy granulation tissue constitutes as effective a barrier as the unbroken integument.

Depending upon the bacteria present, infection may remain localized or become systemic. Tetanus is an excellent example of a wound infection with systemic manifestations. There are many bacteria that may produce local wound infections. They are usually gram-positive.

Prophylaxis of Wound Infections

Reference has been made to the operating-room procedures which minimize the number of wound infections. The handling of the wound itself merits attention. Bacteria are always present in a fresh wound. Blood and tissue debris are excellent mediums for the growth of bacteria. Every effort should be made to control hemorrhage, but good technique does not include an excessive number of ligatures. Each ligature is a foreign body. Ligation *en masse* is to be discouraged because of the areas of devitalized tissue produced. Frequently, gentle pressure with sterile sponges controls hemorrhage with far less tissue destruction. Wiping of fresh wounds is poor technique. The trauma to the viable tissues is too great for any good that can result from the practice. The use of tourniquets or of pressure bandages is to be discouraged because of the over-all interference with the blood supply resulting in devitalization and even necrosis of the viable tissue. Hemostats should be applied with care. Only the bleeding vessel should be grasped. When, for the sake of speed, tissue is grasped along with the bleeding vessel, the tissue is devitalized and may become necrotic.

Traumatic wounds present a more complicated problem. The edges are not smooth. There may be debris within the wound. The time is

pertinent—if more than six hours, the wound is probably infected; if more than twelve hours, it is certainly infected. The wound must be cleaned thoroughly but, at the same time, there must be a minimum of traumatic insult to the viable tissues. Irrigating with a sterile non-irritating solution (e.g., boric acid solution or physiologic salt solution) will often accomplish much without damage to the tissue. If there is much dirt present, it may be necessary to scrub the wound with a detergent. Tincture of green soap is satisfactory. The vigorous scrubbing is necessary to remove the foreign material even though it may be at the expense of additional trauma to the viable tissues. The ragged edges of tissue should be removed.

At one time, it was considered good practice to attempt to kill the bacteria in a wound by the application of a bactericidal agent. Unfortunately, some still try to destroy bacteria with chemical agents. Little do they realize that at the same time the bacteria are destroyed, many delicate viable tissue cells are destroyed, producing necrosis, tissue debris, and more food for bacteria. Most are familiar with the legend of the battle of Danvilliers in 1552, when Paré, running out of boiling oil, was astonished to observe that the wounds healed more rapidly and with less suppuration. Lister used carbolic acid to reduce the number of bacteria in a wound, and since then many products have been used—iodine preparations, the mercurials, a number of dyes, etc. None of them had any effect upon local wound surfaces when administered systemically. Either they were too toxic, were not absorbed, or were precipitated out by the proteins of the blood or tissues. They could only be used locally, and if used in sufficient concentration to be bacteriostatic they destroyed viable tissue. Many agents react as readily with the protein of the wound exudate as with the bacteria, so that the antiseptic properties that can be demonstrated *in vitro* are not present *in vivo*. Many antiseptics are toxic to leucocytes, interfering with the local operation of the natural defense mechanisms of the body. In more recent years, milder antiseptics (boric acid, potassium permanganate, zinc peroxide, hydrogen peroxide, etc.) have been used to advantage. Surgeons have been reluctant to accept the milder preparations, still believing the stronger preparations are necessary to kill the bacteria. Frequently, one observes a case where a strong chemical has been applied. Subsequently, there is profuse discharge from the wound. The clinician, forgetting that the discharge is probably the result of tissue reaction and tissue destruction by the strong applications, reasons that the bacteria present in the wound are multiplying and proceeds to apply still stronger local antiseptics. It is a vicious cycle.

The sulfonamides and penicillin do not fall in the above category. They may be applied locally or systemically. If a sulfonamide is to be used locally, one of the more soluble products should be selected because only that which is soluble and absorbed can be of value. The use, locally, of large quantities of a sulfonamide can do no good—the excess will simply remain in the wound as an inert foreign body. Just enough should be dusted into the wound to give the appearance of a frosted surface. Penicillin may be used locally, but the aqueous vehicles will maintain a concentration of penicillin for not more than a few hours; the other vehicles are apt to constitute a foreign body within the wound. It is more rational to use either the sulfonamides or penicillin systemically, thereby obtaining a bacteriostatic effect in the wound fluids and in the tissues immediately adjacent to the wound. It is far more effective to prevent infections by this means than to treat them after they have become established. It is easier to cope with 3,000 bacteria in a contaminated wound today than to treat an infected wound containing 3 billion bacteria tomorrow. In view of this fact, systemic administration of penicillin or sulfonamides for twenty-four hours before major surgical procedures has increased.

TREATMENT OF INFECTED WOUNDS

Infected wounds differ from contaminated wounds in that organisms have started to grow and may have invaded the adjacent living tissues. If less than six hours, it is safe to assume that the bacteria are probably on the surface. The infection may be quickly controlled either spontaneously or by act of the surgeon, or the infection may rapidly progress to jeopardize the life of the patient. The treatment must of necessity be varied according to the circumstances.

Until the infection is localized, surgery is usually contraindicated. In the presence of lymphangitis and cellulitis, an incision can only open up additional lymphatics and blood vessels for the spread of bacteria and toxins. It is indicated to administer systemic chemotherapy (penicillin and/or sulfonamides) and to apply warm moist compresses. When it then becomes necessary to incise, the chance of spreading the infection has been diminished by waiting until suppuration is actually present. I can think of but few indications for incision in the treatment of an infected wound. The danger in traumatization, necrosis, and the opening of new avenues for the spread of infection is too great. When suppuration has occurred, incision becomes necessary in order to avoid the dangers of tension, accumulated toxins, and spread of infection. When to incise is a moot question—usually, the earlier the better, after the suppurative

process has been isolated by granulation tissue.

Rarely, a very virulent organism sets up an infection that spreads so rapidly that the living tissues cannot effectively localize the infection. The patient manifests systemic symptoms: increased temperature, pulse rate, and respiratory rate. Septicemia, pyemia, or toxemia may be present. The immediate re-opening of the wound is indicated, together with supportive systemic treatment. Tetanus, erysipelas, or gas gangrene infections, when recognized, may be treated by the parenteral injection of specific antitoxin or antiserum. The incised wound is irrigated with a nonirritating antiseptic—more for the mechanical removal of bacteria and debris than for the antiseptic action. When the decision has been made to incise an infected wound, bold incision is to be commended. Adequate drainage, together with the systemic administration of penicillin and/or one of the sulfonamides might very well be adopted as a standard.

An old granulating infected wound, or a traumatic wound in which dirt has been ground into the tissues, requires a special technique. Cleanse the wound and adjacent area with a soft sponge and a nonirritating soap. Shave the hair from the area adjacent to the wound. Irrigate the wound with physiologic salt solution. Pack or cover the wound with sterile gauze. Drape the patient and prepare for an aseptic operation. Either a general or local anesthetic may be used. If procaine solution is used, it should be injected well back from the edges of the wound. Remember that procaine is a derivative of para-aminobenzoic acid which is antagonistic to the bacteriostatic action of the sulfonamides. Remove the wound with the sterile gauge pack inside *in toto*, maintaining as rigid asepsis as is possible under the circumstances. At the completion of the excision, the tissues remaining should be viable and healthy. Control the hemorrhage, remove the drape, wash, dry, and apply antiseptic to the skin adjacent to the wound. With a fresh sterile set-up, close the wound and apply an absorbent compress. As few sutures as possible should be used and the tension on the sutures should not be great. There should be space for seepage of exudate from the lips of the wound. In some instances where there is doubt about the completeness of the excision or the rigidity of the aseptic technique, it may be indicated to pack the wound with sterile gauze, cover with a sterile compress, and allow to heal by second intention.

CONCLUSION

The over-publicized value of the use of the newer chemotherapeutic agents in the control of wound infections may have caused some individuals to neglect the basic principles of surgery. We must remember that the effect of chemotherapeutic agents on the bacteria in a wound is only one of a great many factors contributing to the desired end result. Good sound surgical practices are more important than the use of penicillin and the sulfonamides. The introduction of penicillin and the sulfonamides has not made possible the abandonment of any of the surgical practices established by years of experience.

The Berman Locator in Surgery

The Berman locator, operating on the same principle as a simple mine detector, was developed during the last war to aid surgeons in detecting magnetic metal. An electromagnetic field is set up about the probe of the detector, and when any metal capable of interfering with that magnetic field comes within its range, the magnetic field is broken. The break is indicated on a dial of the machine, as well as by a sound device that makes it unnecessary for the operator to watch the dial.

The School of Veterinary Medicine, University of Pennsylvania, uses one of these machines in connection with surgery on traumatic gastritis cases. After foreign material has been removed from the rumen or reticulum, the probe, encased in a rubber sleeve, is introduced to detect objects that may have been by-passed. Dr. E. A. Churchill (*Vet. Exten. Quart.*, No. 111, U. of Pa., June 16, 1948) reports it has proved useful in cases of traumatic gastritis when the offending metal has passed completely through the wall of the reticulum anteriorly and is beyond reach from within the reticulum. By passing the probe over the wall of the reticulum, the presence of metal can be detected.

Use of the locator on a large number of cattle disclosed that practically every one of them harbored some kind of metallic objects in the rumen or reticulum, very few of which caused actual damage.

The mechanism also has a limited application in small animal practice, as an aid in detecting foreign bodies of ferrous origin. It is valueless against wood, glass, gold, silver, and other nonferrous objects.

Is There a Double Standard in Antisepsis?

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MANY veterinarians appear to believe that there exists, and should continue to exist, a double standard of asepsis as practiced by the human surgeon and the veterinary surgeon. Others, notably Farquharson, Lacroix, Gadd, Allam, and Arlein, believe that asepsis is both right and proper, and entirely feasible in veterinary surgery. Veterinary antisepsis, or disinfection, has also followed a divergent standard from that of the surgeon. There seems to be a general failure to understand that antisepsis, as well as asepsis, depends primarily upon simple cleanliness as a prerequisite to germicidal activity.

The operating room practices and procedures at the Angell Memorial Animal Hospital, which aim at aseptic surgery, have included considerable use of a quaternary ammonium compound since 1940. It was at this time that the staff members adopted the theory and practices of Dr. Carl Walter, who is an associate professor of surgery and director of the laboratory for surgical research, Harvard Medical School. His technique used in the preparation of the skin and hands for surgery and in the care of instruments has been described by Arlein and Walter.[1] It is not intended to infer that this is the only proper method of preparation of tissue for surgery. We do, however, subscribe to Walter's theory that the tissue or surface must be rubbed and scrubbed with surface active agents, and that the painting on of iodine or of any other tinted tincture does not presuppose effective sterilization. Primary healing, the *sine qua non* of surgical technique, seems to prove Walter's theory at our hands. It would seem reasonable to suppose that the same principles which govern surgical preparation of the skin and hands apply to the teats and udders of cows also, and that the surface activity of selected quaternary ammonium compounds should be useful there as Walter has proved it to be on the skin elsewhere.

In the article by McCulloch, Hauge, and Migaki,[2] concerned principally with the quaternary ammonium compounds, both the data and the conclusions may be subject to serious question in the light of the works and conclusions of other well-qualified scientists and physicians. Some of us believe that the surface active agents, particularly selected quaternary ammonium compounds, furnish the means to the desired end in asepsis and antisepsis better than do any other available antiseptics and germicides, irrespective of *in vitro* bactericidal tests which may appear to discredit these compounds. There is more to the use and application of antiseptics than meets the eye. The writer, however, believes that these compounds should form the basis for revolutionizing veterinary antisepsis.

McCulloch and his coworkers[2] do not make it clear that: (1) The surface activity (detergency, solubleness, emulsifying, capillary-penetrating, wetting, and spreading action) contributes markedly to the bactericidal effect of the quaternary ammoniuim compounds when they are used in conditions of actual practice. (2) When properly used, some quaternary ammonium compounds do actually have marked bactericidal properties. (3) The failings, ascribed by McCulloch *et al.* to this class of compounds, are largely a failure in method of application, not in the material itself. These failings also apply to all other germicides when applied over dirt, oil, blood, pus, etc. (4) There is a difference in the behavior and basic activity of the various quaternary ammonium compounds.

Glassman,[3] in an article defining the properties of a group of chemicals known as surface active agents, credits Domagk with initiating the current interest in the application of a quaternary ammonium compound (trialkonium chloride-zephiran) as a bactericide in the field of medicine. Glassman appears to have studied the subject rather well, since he quotes 249 references.

The first conclusion of McCulloch and his coworkers states in part, "For the disinfection of skin prior to minor surgical operations and injections, these compounds (quaternary ammonium) can be classed as convenient but only fairly reliable germicides." This does not appear to be proved in the context of the article. Bactericidal activity of an agent in surgery is difficult to measure by the terms advanced by McCulloch *et al.* For example, Walter[4] has demonstrated that a surgeon can effectively sterilize his hands by a ninety-second scrub with hexachloraphene (G 11) in soap or in a detergent, and yet this material is apparently so weak from a bactericidal standpoint that its biologic activity is difficult to demonstrate. Using this compound (G 11) in a scrubbing machine designed to eliminate all possible human error, two minutes of scrubbing lowered

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A rebuttal to the conclusions of McCulloch, Hauge, and Migaki.[2]

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the resident bacterial count more than did twenty minutes of scrubbing with ordinary soap.

What is the answer to this? In surgical antisepsis, the end to be desired is effective sterilization of the surgeon's hands, the patient's skin, and the instruments and materials with which he works. The surgeon is also concerned with avoiding damage to the substance to be sterilized. It matters little whether the organisms are destroyed by bactericidal action or surface activity, *so long as the skin or the instruments are not damaged.* If this were not so, we should use a blow torch to disinfect the skin and hands of the surgeon as well as the milk pails, teats, and udders for milking.

Walter[5] reiterates again and again that surgical and chemical disinfection depend upon cleanliness, rubbing, and scrubbing, far more than upon the use of a material, the supposed properties of which are to destroy all bacteria regardless of the presence of proteins, tissue debris, and dirt. He believes that, "Germicides (all germicides) are highly selective, erratic, and unreliable unless applied carefully," but, nevertheless, they contribute greatly to aseptic technique. He further states, "Absolute cleanliness of the surface to be disinfected is essential for reliable germicidal action. Blood, pus, oil, grease, soap, moisture, all decrease or nullify the effects of (all) germicides." Of instruments, Walter indicates that they must be mechanically cleaned before immersion in any germicide. Mechanical cleansing has been rediscovered as the most important factor in removing organisms from the skin. The result is emphasis on making the skin surgically clean by actually scrubbing off the organisms which adhere to the surface or grow in the superficial desquamated epithelium.

In view of Walter's conception of cleanliness as a basis for antisepsis and asepsis, it is not surprising that he finds considerable use for selected quaternary ammonium compounds, for these solutions have marked bactericidal powers as well as detergency, solubleness, emulsifying, capillary-penetrating, wetting, and spreading action. He recommends these substances in proper dilution for disinfection of the skin in surgery, for the sanitization of tableware, furniture, etc., and for the disinfection of instruments.

McCulloch's second conclusion, that the quaternary ammonium compounds do not afford positive protection when used as general disinfectants "under the conditions of actual practice," seems to represent a biased opinion. Is it not the "conditions of actual practice" which should be criticized, rather than the compounds? Other researchers believe that all germicides are inactivated by the presence of "manure, milk, blood, and tissue debris."

Walter[6] proved that one of the quaternary ammonium compounds did actually destroy spores when used for cold sterilization of instruments. In addition, Walter's text[5] includes a large number of popular germicides, many of which are in use in veterinary medicine and surgery, under the heading, "Germicides Unsuitable for Surgery where Spores Should be Killed." These include bichloride of mercury, the time-honored phenol group, and many mercurials and other antiseptics, the popular names of which would be recognized by all. This list does not include the quaternary ammonium compounds, which Walter has tested.

To the contention that these compounds lose much of their germicidal activity when mixed with certain types of water, we can answer that this is undoubtedly true. However, in preparing solutions for the operating room, distilled water should always be used. It is also true, as indicated by both Walter[5] and Glassman,[3] that there is considerable difference among the quaternary ammonium compounds themselves and that the alteration in germicidal activity in dilution depends considerably upon the degree of dilution.

McCulloch *et al.* should also point out that other commonly used antiseptics are also markedly affected by apparently minor changes. For example, iodine is ineffective when dry, and ethyl alcohol, which is taken by all to be an active germicide, is truly so only when it is at a very exact concentration of 70 per cent by weight. Price[7] proved that 70 per cent alcohol by weight is 30 times as effective as an 80 per cent by weight preparation.

McCulloch's third conclusion rests on the same premise, that is, that the quaternary ammonium compounds are alone in failing to penetrate tissue debris, blood, pus, etc., which frequently contaminate instruments. Walter[5] believes that it is highly improper to attempt to sterilize instruments with live steam under pressure unless they have been thoroughly cleansed of blood, dirt, grease, etc.

McCulloch's fourth conclusion also represents an opinion with which others might justifiably disagree. Glassman[3] indicates that the supposed inability of the surface active agents to destroy the influenza virus has been disproved, when proper concentrations of the quaternary ammonium compounds are used.

The fifth conclusion, "No practitioner is justified in hazarding his own safety and that of his patients and clients by using a disinfectant which has not been proved effective against the pathogens he wishes to control and under his working conditions," does not offer the practitioner anything, according to the writer's interpretation. The words "working conditions" seem, to the writer, to offer the key to the solution of the problem of disinfection.

"Working conditions" in surgery and in disinfection of the cows' udders and the utensils of dairying should not include an attempt to sterilize a dirty surface with any germicidal solution by merely laying it on. Instead, should not the surface be cleansed by rubbing, scrubbing, or washing with a solution which has surface activity and bactericidal powers in addition to being nonirritating, odorless, and nonpoisonous when used in proper dilution?

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Early Diagnosis of Pregnancy in the Mare

The following technique for the determination of pregnancy in the mare was developed in 1936 by Drs. Yoshimasa Nishikawa and Norio Kuroda of the Institute for Horse Breeding and Hygiene, Nishinasuno, Japan. It appears to have several advantages over the hormonal pregnancy test, using laboratory rabbits, that is commonly employed in the United States.

The method consists of making an impression smear of the cervix. With the mare under proper restraint and using aseptic technique, the cervix is made accessible through the introduction of a vaginal speculum. Next, a microscopic slide, held in a special holder to prevent contamination of, and injury to, the vagina, is inserted and an impression made of the cervix. The slide is then withdrawn and a pregnancy diagnosis can be made either microscopically or macroscopically. The latter method can readily be used by the veterinary practitioner in the field.

Observation of the slide with the naked eye will disclose, if the mare is pregnant, a thick, tenacious, white mucus with a marked gloss to the surface. The white mucus may become more pinkish as pregnancy progresses so that, at the end of six months gestation, the impression is quite pink in appearance. If no pregnancy exists, the impression will be thin and watery and almost transparent, and will lack the gloss seen on the slide from the pregnant mare. The picture is the same in metritis and vaginitis, except that white streaks of pus are dispersed within the watery substance.

Viewing the slide under the microscope, large numbers of mucous cells and desquamated epithelial cells are seen if the mare is pregnant, compared to only a few of either seen in nonpregnancy. The microscopic picture in metritis and vaginitis does not need description.

Using this method of diagnosis, pregnancy can be diagnosed after fifteen days of gestation with an accuracy range of approximately 90 per cent. Thus, the advantages of the test are that it can be used to diagnose early pregnancy and, also, that it can be used in the field with a minimum of difficulty.—*Charles H. Stengel, D.V.M., APO 201, San Francisco, Calif.*

Estrogenic and progesteronic changes can be produced in the nongravid uterus, but the development of the maternal placentome requires something that we have not yet been able to supply.—*H. E. Kingman, Am. J. Vet Res., April, 1948:125.*

A hen laying 200 eggs per year needs about 2½ lb. of calcium for egg production alone, plus additional amounts of this mineral to meet body requirements.—*Vitamineral News.*

The statement that hemophilia is a disease of the male does not hold true for swine and may not for other species, even man.—*Hutt et al., J. Hered., Jan., 1948.*

High Alfalfa Rations in Swine Breeding.—Gilts intended for use in breeding need better rations, especially more alfalfa, than animals being fattened for market—and the earlier they are started on good rations during the growing period, the better off they will be with respect to conception, reproduction, and lactation. Experiments at the State College of Washington (*J. Anim. Sci.*, Feb., 1948) demonstrated that it took less time for gilts to conceive, no sterility resulted, and a higher percentage of their offspring were weaned when 15 per cent of alfalfa was fed during the growth period, as compared with a level of 5 per cent.

CLINICAL DATA

Clinical Notes

Biting of the tail in dogs is a form of peripheral neuritis often associated with vitamin B deficiency.

In mastitis, an infection with *Corynebacterium pyogenes* causes a secretion or exudation of foul-smelling milk.—*O. W. Schalm, D. V. M., California.*

Jumping may help to initiate paralysis of the serratus magnus in horses, according to McCunn, of the Royal Veterinary College.

Scours in 2- to 3-week-old pigs nursing sows that are overfed or suffering from mastitis or metritis may be treated by feeding the sows 1 teaspoonful of formalin in the feed daily.—*C. A. Lemon, D.V.M., Illinois.*

Viable organisms of infectious caprine mastitis have been found in straw and dust of barns up to thirty days after infected goats were eliminated from the herd. —*Dairy Goat Journal.*

Arthritis in lambs may be caused by Corynebacterium infection, *Erysipelothrix rhusiopathiae* infection, vitamin E deficiency or so-called white muscle disease.—*Lee Seghetti, D.V.M., Montana.*

In selecting blood substitutes for intravenous injection, it is well to remember that gelatin is probably the cheapest of the satisfactory materials, while plasma from animals given heparin before bleeding is probably the best.—*W. D. Daugherty, D.V.M., Illinois.*

The milk loss occasioned by brucellosis may be estimated on the following basis: Of 26 million cows, 5 per cent are infected. Of these, the milk production is expected to decrease about 20 per cent. This means that the total decrease in milk production is about 6 1/3 billion pounds or more, and that the value of this amount of milk at present-day prices is more than 50 million dollars.—*C. K. Mingle, D.V.M., Beltsville, Md.*

On some farms, it may be necessary to treat pigs less than 24 hours old with swine erysipelas serum to avoid the disease.—*C. A. Lemon, D.V.M., Illinois.*

A cow with a bad tooth is likely to lap water like a dog to protect the tender tooth from chilling.—*E. R. Frank, D.V.M., Kansas.*

A bucket, a sponge or brush, and a can of lye or disinfectant should be standard equipment in the car of every veterinarian. —*A. E. Wardlow, D.V.M., California.*

Brucellosis vaccination of the adult animal is most dangerous during the middle third of gestation.—*C. K. Mingle, D.V.M., Beltsville, Md.*

Uncleaned tripe is a more reliable treatment for hysteric conditions in dogs than the most modern therapeutic preparations, R. H. Smythe told a recent meeting of the Derbyshire (England) Veterinary Association.

Fox encephalitis affects only the endothelial tissues. It is not a true encephalitis, since it does not affect the nerve tissue proper. This type of fox encephalitis produces intranuclear inclusion bodies.—*H. A. Seidentopf, Ph.D., Wisconsin.*

By putting a tack in the toe of each of the claws and wiring the claws together so that they cannot spread, animals afflicted with foot rot suffer less pain in walking.

Oral doses of vitamin C before surgery, or hypodermic injections after surgery, help to promote fast, clean healing in dogs as well as other animals. Slow-healing wounds are likely to respond especially well to such treatment.

The importance of the thyroid gland to lactation is shown by the fact that if this gland is removed from a cow, milk production will decline as much as 75 per cent.—*Moore, USDA.*

Atypical Pseudorabies and Listeriosis in Cattle

A. F. SELLERS, V.M.D., M.Sc., B. S. POMEROY, D.V.M., Ph.D.,
J. H. SAUTTER, D.V.M., L. H. PINT, D.V.M., and C. E. SCHRAFEL, D.V.M.
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AN OUTBREAK of disease with encephalitic symptoms affecting 3 of 18 cattle on a small farm in southern Minnesota, and a single case of a clinically similar condition in the University of Minnesota beef herd comprising 97 animals are reported and discussed.

HERD 1—SEPTEMBER 30, 1946

CASE HISTORIES

The affected herd was on a small farm in southern Minnesota and consisted of grade Shorthorns—11 cows, 1 herd bull, 2 young bulls, and 4 calves. The calves were pastured separately. The adult cattle and 140 hogs were together on a timothy-clover pasture. The hogs had been vaccinated with hog cholera antiserum and virus Sept. 1, 1946.

Silage was used to supplement the pasture during the dry part of the summer, up to about September 1, after which green corn and oats were fed to all animals.

The bull sickened the morning after the first light frost on September 24 and only one further feeding of the green corn was made.

Upon the outbreak of disease, the premises were searched for poisonous plants and for possible access to painting supplies, with negative results.

Shorthorn Bull, 2½ Years Old, Herd Sire.—The animal appeared normal and ate as usual the evening of September 24. Early next morning, he was noticed standing in a mud hole in the pasture, was bloated, had a "wild look," and the head and neck appeared turned to one side. In a short while, he lay down in the mud hole, but arose upon urging and walked to the barn. He was later noticed to stagger, by the owner.

The owner's veterinarian examined the animal the following day. A bruise was found on the side of the head but no wounds or abrasions on the limbs or other parts. Chewing movements and salivation were continuous. The head was turned to the left, and the animal walked in circles to the

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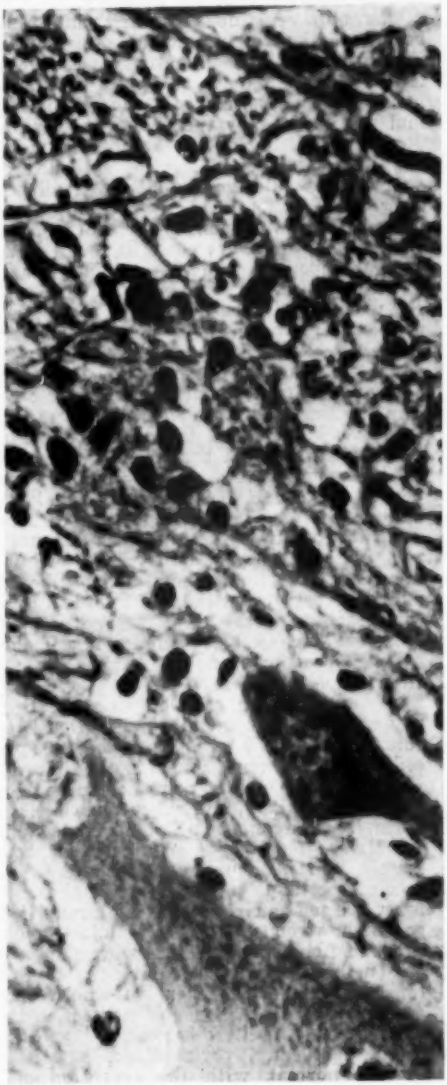

Fig. 1—An area of cerebral cortex showing an increase in the number of glial cells. x 770.

left. He showed no particular excitement or increased reaction to noise or disturbance. No efforts were made to lick or rub himself. He was markedly bloated; the temperature was 100 F.

The bloating was relieved by trocarization, and antiferment administered *via* the rumen cannula. Reinsertion of the cannula proved necessary after fifteen minutes, due to recurrence of the bloating.

The bull remained standing until just before death at about noon September 25. The gross findings on autopsy were negative.

Shorthorn Cow, 5 Years Old.—This animal was noticed by the owner to be lying down and getting up repeatedly, the morning of September 26. She extended all four limbs while down and pawed all bedding from beneath her. Trembling was present, but no chewing movements, salivation, or bloating were noted at that time.

The temperature was normal upon examination by the veterinarian September 27. No wounds or abrasions were found, and no bloating was present; eructations were regular. No marked clinical changes were noted, no feed was eaten, and the cow was not seen to drink during the next two days. The evening of September 29, the temperature was 103 F., and the animal was licking the skin behind the front legs.

The morning of September 30, the temperature was 101 F., and the animal was unable to rise. The first passage of feces since the beginning of the illness occurred at this time; they were scant in amount, covered with mucus, and dark. She remained prostrate on the right side and was comatose during this day. At about 8 p.m., occasional weak struggling movements, dyspnea, stertor, pronounced salivation, and slight bloating were noticed. Licking of the skin had been seen only on the third day of illness, as noted above. Death occurred at about 9 p.m. September 30, preceded by slight tonic spasm of the limbs.

Autopsy showed the condition to be good, and the skin, hair, and subcutaneous tissue normal. Many fibrous and fibrinous adhesions were found over an area of approximately 10 cm. diameter on the lateral surface of the diaphragmatic lobe of the right lung. Upon incision of this area, light greenish, viscous pus was found. Smaller areas of fibrinous adhesions were also present on the diaphragmatic surface. The anterior lobe showed extensive emphysema; atelectasis, moderate edema, and congestion were present in the other lobes.

The left lung, pericardium, and heart seemed normal, with the exception of a small hemorrhage on a cusp of the left atrioventricular valve.

A few ecchymotic hemorrhages were noted on the omentum. One small (½ cm. in diameter) anemic infarct was present in the cortex of each kidney. The uterus contained an apparently normal near-term fetus. The meninges and brain appeared normal grossly except for a slight thickening of the tentorium cerebelli.

Shorthorn, First Calf Heifer.—This animal had calved six weeks previously. She was first observed to be ill September 29, when she was noted to lie down much of the time. She appeared to the owner to be in estrum this same day.

The evening of September 29, a dark, watery diarrhea was noted and the animal had not eaten her evening feed. She got up and lay down frequently and charged anyone passing in front of her; she also lunged into the stanchion for no apparent reason.

The following day, she was moaning and salivating, had a temperature of 98 F., and made no attempt to eat. No licking or rubbing was noticed. She became prostrate during the evening, making periodic unsuccessful efforts to get up. The head and neck were kept turned to the left, except when trying to arise; during these times the head and neck were forcefully swung around from one side to the other.

At about 9 p.m. (September 30), she got up with difficulty. Slight stupor, lack of reaction to noise or disturbance, grinding of the teeth, and poor vision were noted at that time. There was no attempt to charge personnel and no signs of licking or rubbing of skin were seen until a short time prior to death, about noon October 1. Rubbing off of the hair over an area of about 12 to 15 cm. in diameter on the right lower jaw had occurred prior to death.

Differential Diagnosis

In view of the herd history, and the histories, symptoms, and gross autopsy findings shown by the affected animals, the following were considered as possible causes: rabies, pseudorabies, infectious encephalitis (listeriosis), sporadic bovine encephalomyelitis, lead poisoning, and corn poisoning.

Laboratory Examinations

Shorthorn Cow, 5 Years Old.—No evidence of rabies was found in impression smears of the hippocampi, or in tissue sections (stained with hematoxylin and eosin) of the hippocampi, cerebral hemispheres, cerebellum, or medulla oblongata. Cultures of the brain were negative for pathogenic

bacteria. Chemical examination of the liver was negative for lead.

A rabbit injected October 1, subcutaneously, with brain suspension died five days later showing marked abrasion and laceration at the point of inoculation. Cultures of the rabbit's brain were negative for pathogenic bacteria after six days of incubation.

Shorthorn Heifer.—On October 2, the head was brought to the laboratory by the owner. No gross changes were observed on the meninges or dorsal surface of the brain, but there was considerable congestion of the blood vessels on the ventral surface of the brain stem. No evidence of rabies was found in smears or sections of this brain.

Cultures of the brain were negative for pathogens. A rabbit injected subcutaneously on October 2 with brain tissue suspension died five days later, with marked abrasion and laceration being found at the point of inoculation. Cultures were made of the rabbit's brain; no pathogens were recovered after six days of incubation.

Brain material was pooled from both the rabbit injected with brain suspension of the Shorthorn cow, and from the rabbit injected with brain suspension of the Shorthorn heifer. This pooled material was injected subcutaneously into a third rabbit. Five days later, this last rabbit was found lying comatose on its back, but with occasional clonic spasms of the limbs. Marked laceration and bleeding was noted in an area of skin, about 3 cm. in diameter, at the site of injection. Death occurred during the afternoon. Cultures of the brain of this rabbit were negative for pathogens.

HISTOPATHOLOGY

Tissues were taken for histopathologic examination from the lateral cerebral cortex and several areas of the basal ganglia.

In the cortical tissues examined, some of the nerve cells were necrotic while others showed a mild chromatolysis, the tigroid bodies of the cytoplasm being barely discernible. The nuclei and nucleoli of a few neurons were very difficult to identify. The majority of such cells had completely lost their normal morphology. An increase in the number of glial cells was noted (fig. 1), and the microglial cells appeared to be larger and more irregular in shape than normal.

Marked perivascular cuffing (fig. 2) and congestion was observed in all brain sections examined. The walls of the capillaries and vessels appeared thickened, due to swelling of the cytoplasm of the lining endothelial cells.

In general, the histologic findings conform to those described by Hurst.[9]

DIAGNOSIS

From a consideration of the herd history of close association of the affected cattle with swine, the meningo-encephalitic symptoms of the animals affected, the acute course, the negative chemical and cultural findings, and the positive inoculation results with typical symptoms in the rabbits, a diagnosis of pseudorabies (Aujeszky's disease) was made.

HERD 2—FEBRUARY 20, 1947

CASE HISTORIES

Shorthorn Cow, 5 Years Old, Purebred.—When the animal was brought into the barn from the exercising lot on the afternoon of February 20, the herdsman noticed that

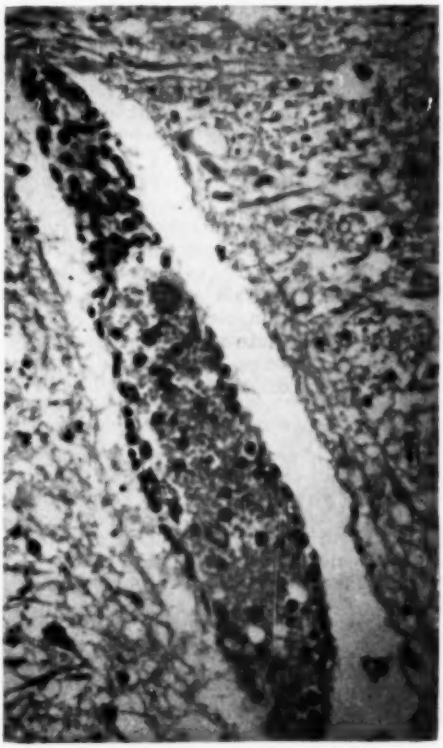

Fig. 2—Section through an area of basal ganglia showing perivascular cuffing. x 333.

she appeared to have a stiff neck. She was quartered in a tie stall, but the next morning was found with the fore feet in the manger and pressing her head against the manger. The animal was placed in a box stall; she became excitable and moved about in the stall when approached by the herdsman.

On February 22 when examined, saliva drooled from the mouth, the temperature was 103 F., and the animal had no appetite. When the herdsman went into the stall, she circled to the left. She seemed to resent the presence of anyone and would make sudden thrusts at the attendant.

On February 23, she was unable to rise and, since the paralysis continued, was destroyed.

No significant gross lesions were noted in the internal organs on autopsy. When the calvarium was removed and the meninges opened, the cerebrospinal fluid was slightly blood tinged and appeared increased in amount.

LABORATORY EXAMINATIONS AND DIAGNOSIS

Portions of the cerebrum, cerebellum, and brain stem were ground in a mortar and seeded on blood agar plates. A gram-positive bacillus was isolated. The organism was identified as *Listeria monocytogenes* by its biochemical and staining characteristics. Cultures prepared from the heart blood, liver, and spleen were sterile.

Round cell and polymorphonuclear infiltration of the brain stem and cerebrum were noted. The most extensive changes were found in the brain stem.

From the meningo-encephalitic symptoms shown, the acute course, and the positive cultural findings, a diagnosis of listeriosis (listerellosis) was made.

LITERATURE

A minimum of pruritus apparently characterized the disease seen in the cattle from which pseudorabies virus was isolated. The affected animals died approximately six, ninety-three, and eighty-four hours after the signs of illness were first noticed. Presumably, the animal first affected (Shorthorn bull) sickened some time before the owner noticed his peculiar behavior. Udall[1] describes intense pruritus as the first symptom, usually affecting an area of skin over the hindquarters, with death occurring thirty-six to forty-eight hours after the first symptoms appear. As well as showing a minimum of this symptom, the cases here described exhibited marked bloating in 1 case, and rather marked meningo-encephalitic symptoms in 2 cases (circling, charging, twisting of head and neck in unnatural positions, stupor, partial blindness). Hagan[2] notes that, in all affected species, occasional cases are seen in which the disease takes the form of an encephalitis without cutaneous itching. These are almost invariably fatal, even in swine.

Bloating and clonic contractions of jaw and neck muscles are mentioned among the symptoms in cattle by Hutyra *et al.*[3] All but 1 of 9 fatal cases described by Shope[4] in Iowa manifested an extreme pruritus as a cardinal feature. The 1 case which did not show any pruritus was ill and lay listlessly in the barn lot for six days. On the last day, she developed clonic convulsions, salivation, grinding of the teeth, and died in much the same manner as the others (violent tossing of the head, groaning, and rapid shallow respiration). Among cases reviewed by Galloway,[5] two distinct groups of symptoms were observed in some cases reported from Holland. In the first, the predominating symptom was pruritus; sneezing and snorting were also noted, accompanied by sudden attacks of fury. In the second, regional muscular spasms, profuse sweating, and an increased respiratory and pulse rate were recorded. Pruritus was not usually present during the first stages. Underbjerg[6] reported cases in Iowa cattle, some of which showed no pruritis.

DISCUSSION

It is to be noted that none of the 140 hogs pastured with the affected animals showed any illness up to, or subsequent to, the illness and death of the cattle. Further, some of these hogs were sold by the owner to neighboring farms. These were marketed within six months following the illness of the cattle, without having shown any evidence of similar disease. No further trouble of a similar nature has been experienced to date with the cattle and hogs remaining on the farm where the outbreak occurred.

The above observation seems interesting in view of Shope's work[7,8] demonstrating swine and rats as reservoir hosts of the virus. In the majority of cases, pigs affected with Aujeszky's disease have only a mild febrile illness; pruritus and nervous symptoms may be entirely absent.[3,5,7,8]

With regard to the animal from which *Listeria monocytogenes* was isolated, it was of interest that it was the first animal in this herd to develop symptoms of encephalitis. The herd has been under the constant supervision of the Division of Veterinary Medicine for many years. No new cases have occurred in the past year. In previous years, an occasional sheep in the station flock has died from listeriosis. Most of the cases in the sheep were seen in the late winter and early spring. There

have been no new cases in the sheep flock for the past two years. There has been no direct contact between the sheep and cattle. Very few additions of breeding stock have been made to the beef herd or sheep flock in the past few years. It appears that some sheep and cattle might serve as carriers to account for the reappearance of the infection over the course of several years, as has been the case in the sheep flock.

In both the pseudorabies and listeriosis cases here reported, laboratory examinations permitted differential diagnosis.

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Eczema in Danish Hogs

In the late winter and early spring, lesions in the skin of pigs, diagnosed by the routine meat inspection as scabies or eczema, are common. During the remainder of the year, these lesions are rare. Usually, mites cannot be demonstrated in skin scrapings.

From April 1, 1945, to March 31, 1948, 77,986 pigs were killed at the coöperative bacon factory of Graasten. In 201 (0.26%) of these pigs, scabies or eczema was diagnosed.

The affected animals came from 161 farms from which a total of 8,266 pigs had been received. Although 2.43 per cent of the pigs received were affected, 134 farms had only 1 case each, and the remaining 27 farms had 2 to 7 cases each; *i.e.*, the disease usually appears in a single case in a herd, without the tendency to spread to other pigs.

Of the 201 cases, 161 appeared from January to May, and the remaining 40 cases during June to December. The explanation of this may be that more pigs are raised in the months subsequent to harvest, or that parasites spread more quickly from animal to animal and from herd to herd in the cold, dark season when less care is taken in cleaning and disinfecting the barns. This is unlikely, for the fact that only 1 animal in a herd is affected during a limited part of the year clearly refutes a parasitic or infectious cause of the disease. On the contrary, it would seem that the lesions are reactions in especially disposed individuals against a universally occurring causal factor.

Naturally, hypovitaminosis A is to be considered as a component in this condition, since more pigs suffer from it when feed is lowest in carotene (vitamin A). Against this hypovitaminosis A hypothesis, it is unusual for only 1 pig to show lesions when all of the herd has received insufficient quantities of vitamin A. This objection is only partly valid as the feed always contains some vitamin A, and the animals suffer from hypovitaminosis A only, and not from a total avitaminosis. Therefore, it is logical to assume that only those animals with low resistance react with lesions of the skin.

Hypovitaminosis A is probably not the only cause; more likely a series of factors are responsible for these lesions, for in more than half of the herds from which the pigs showing scabies-like lesions have come, pigs have had diseases caused by related conditions. Two or more factors, of which hypovitaminosis A is one, can be demonstrated in herds in which pigs are affected with scabies-like lesions of the skin.

Pleuropericarditis fibrosa appears most frequently in pigs from these herds. This may be a sequel to swine influenza; at any rate, the serous cavities show that they have been exposed to a disease characterized by a long convalescence. This is also true when arthritis and scabies-like lesions occur in pigs—whether the arthritis is a sequel to swine influenza or to *Erysipelothrix rhusiopathiae suis* infection. Like conditions obtain in herds with rhinitis chronica deformans and rachitis.

Therefore, it must be assumed that this lesion of the skin of pigs is a nonparasitic skin disease in which hypovitaminosis A and a secondary condition characterized by long convalescence form a casual complex. Susceptible pigs develop the disease, whereas the more resistant animals of the herd do not.—*J. Egehøj, chief of veterinary inspectors at public slaughterhouse, Graasten, Denmark.*

Clinical Report on Amino Acid Therapy

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THIS report points out our experience with amino acid therapy in dogs.

Two solutions were used. One contained protein hydrolysate 5 per cent, glucose 5 per cent, and vitamin B complex. The other was the same except for the addition of 1 per cent gelatin.*

The composition of these two solutions is extremely practical. When the animal's appetite is poor or when food eaten is not utilized properly, amino acids are ready for utilization and so provide a quick source for the proper nitrogen balance; glucose provides for the energy needs of the debilitated animal. However, most seriously ill dogs will not utilize glucose unless vitamin B complex is supplied. Vitamin B complex is also necessary for the breakdown of proteins and, to some extent, for the utilization of fats and carbohydrates. Gelatin maintains the blood volume and can be safely used where saline is contraindicated.

TABLE 1—Distemper Cases

Dog (No.)	Amount (cc.)	Days	Total amount (cc.)	Outcome and remarks
1	200	3	600	Died 2 days following discontinuance of i.v.; encephalitis.
2	200	2	400	Began to eat after 2nd day; uneventful recovery.
3	250	4	1,000	Temporary improvement; eventual death.
4	200	3	600	Began to eat 4th day and recovered.
5	200	4	800	Temporary improvement; encephalitis and euthanasia.
6	250	1	250	Died overnight.
7	250	1	250	Died overnight on 3rd admission to hospital.
8	200	2	350	Died following 2nd i.v.
9	150	1	150	Began to eat; recovered.
10	250	2	500	Began to eat; recovered.

So far, these solutions, used in the treatment of 24 dogs, have had a definitely beneficial effect and, in some of the cases, meant the difference between success and failure. It should be understoood that both solutions were supplemental therapy. The usual standard drugs were used to combat the actual disease, and the amino acids were administered when the body reserves were depleted or when the body functions were operating poorly, due to the disease or condition present.

DISTEMPER CASES (TABLE 1)

Dogs 1, 3, and 5 all demonstrated nervous involvement. Their failure to recover is understandable. The prognosis was negative in dogs 6 and 8, and the attempt to treat them was carried out only at the owners' insistence. Case 7 had been treated twice at the office at intervals of one week, each time showing a high temperature which returned to normal upon treatment. The third admission, however, was after it had failed considerably. Dogs 2, 4, and 9 had been off feed and all began to eat after intravenous therapy. Dogs 9 and 10 were chronic cases and their recoveries were particularly gratifying. Those treated with amino acid therapy for several days adequately demonstrated, even those resulting in death, that it is possible to maintain sick animals on intravenous feeding alone for several days.

LEPTOSPIROSIS CASES (TABLE 2)

Table 2 shows the disposition of cases of leptospirosis and related hemorrhagic gastritis and/or enteritis.

All of these dogs received extensive treatment in addition to the amino acid solutions. All received penicillin. Other intravenous solutions such as 1/6M sodium lactate, lactate

TABLE 2—Leptospirosis Cases

Dog (No.)	Amount (cc.)	Days	Total amount (cc.)	Outcome and remarks
11	150	3	450	Died 3rd day.
12	250	3	750	Died 4th day.
13	200	2	400	Began to eat 3rd day; discharged as recovered 6th day.
14	200	2	400	Died 7th day, 3rd day following start of i.v.
15	200	5	1,000	Began to eat 5th day; discharged 7th day.
16	100	2	200	Died following 2nd i.v.; sick 1 week before admission.
17	200	2	400	Recovered.
18	250	3	750	Recovered.
19	250	5	1,100	Recovered.

*From the Upjohn Co., Kalamazoo, Mich.

Ringer's, and gelatin were also given. Various bowel astringents and protectives were given to those with a hemorrhagic enteritis. There is no question, of course, that penicillin is of primary importance in treating leptospirosis and the allied hemorrhagic gastritis and/or enteritis. However, we do feel that a larger percentage of such cases can be successfully concluded when the appropriate intravenous solutions are used. The theory of administering amino acids and vitamin B complex in such conditions is well understood and appreciated, and their use undoubtedly will save many of the borderline cases that otherwise would be lost. The use of the solution containing amino acids, glucose, vitamin B complex, and gelatin is particularly applicable to cases of leptospirosis. Usually, these cases have lost blood volume which the gelatin counteracts.

TABLE 3—Miscellaneous Conditions

Dog (No.)	Amount (cc.)	Days	Total amount (cc.)	Outcome and remarks
20	150	3	450	Acute glomerular nephritis resulting in reversible uremia and with severe secondary macrocytic anemia; recovered.
21	250	2	500	Severe anemia; began to eat; recovered.
22	200	4	800	Prolapse of rectum; died 5th day following operation.
23	100	2	200	Large abcess from dog bite; died.
24	250	4	1,000	Foreign body; operation; recovered.

MISCELLANEOUS (TABLE 3)

Table 3 shows the disposition of miscellaneous conditions. It was advisable not to feed dogs 22 and 24 for several days following a bowel operation, but they were maintained on intravenous feedings with a minimum of loss in condition and weight. The death of dog 22 was unaccountable. On the fifth day the dog, though obviously depressed, had no fever. On the theory that there was leakage from the bowel, penicillin was administered. However, the animal died that evening. Postmorten examination revealed that the sutures were holding, and there was no leakage or peritonitis. Just what had caused the dog's death could not be determined.

Both anemia cases (20 and 21) were severe and exhibited anorexia. Both began to eat following liver therapy, and we believe that the amino acid solution filled the needs of these animals when they were not taking food. Neither lost condition or weight, although dog 20 had been off feed several days before admittance. Case 23 was admitted with a large abcess on the neck from a dog bite and was practically moribund. It undoubtedly died from absorption of toxins from the abcess.

SUMMARY

It is felt that amino acid solutions fill a definite need in supplemental intravenous therapy; that often their use may save the doubtful cases; that the combination of fluids presented by these solutions is practical; and that the ease of administration of one solution containing all of these factors is obvious.

An Effective Depilatory Formula

Due to the difficulty of removing the soft, luxuriant hair of rabbits with either mechanical clippers or the existing depilatories, a depilatory was compounded by Pitesky and Last (University of Illinois) that is used successfully.

It is prepared by triturating two thirds by weight of purified barium sulfide powder with one third by weight of a commercial detergent. "Tide," "swerl," "orvus extra granules," and "dreft" are reported to be equally effective as the detergent ingredient. Three full teaspoons (25-35 Gm.) of the depilatory are mixed with 50 cc. of a 10 per cent glycerin-in-water solution until a smooth, creamy suspension is obtained.

The depilatory is then applied with a wooden tongue-depressor blade and gently worked into the hair. The hair will gelatinize quickly and practically dissolve. The dissolved hair-depilatory mixture is carefully moved back and forth over the surface where the depilating action seems to be slower. More water may be added to prevent drying. When the hair is completely removed, the area is rinsed with a copious amount of water to insure complete removal of any sulfide residue. The whole procedure takes approximately five minutes.

This sulfide-detergent mixture has been used on various species of laboratory animals and in the pre-operative preparation of dogs, cats, and monkeys without indication of secondary infections or delayed wound healing.—*Science, Dec. 10, 1948.*

Leghorn Broilers.—The practice of destroying Leghorn cockerels as soon as they can be identified is becoming a thing of the past for the reason that the "Leghorn of tomorrow" will be short-legged and heavy-breasted and will weigh 2 to 2½ pounds at 10 weeks of age. At least, that is what a poultryman tells the readers of the *U. S. Egg and Poultry Magazine.*

The Treatment of Skin Diseases of Dogs and Cats with Polysulfide in Propylene Glycol

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Nyack, New York

THIS REPORT describes the treatment of sarcoptic mange, nonparasitic conditions such as dermatitis or eczema (moist and dry), and ringworm, with polysulfide in propylene glycol.* These conditions were accompanied by pruritis, erythema, and alopecia.

Persistent itching and irritation lead to violent scratching which results in bacterial and fungal infections. The specific causes are difficult to determine and microscopic examinations of skin scrapings do not always give the answer. It has been suggested that the flea may be the initial cause of the scratching.

Ointments containing elemental sulfur as the active ingredient have been used in the treatment of these skin diseases. Their effectiveness is dependent upon the formation of sulfide on contact with proteins and alkalies in cutaneous secretions,[1, 2] and the penetrability of the ointment vehicle.[3]

For some years, investigators have been working on the development of penetrating vehicles and solvents which would be capable of carrying a variety of substances into tissues. Herrmann, Sulzberger, and Baer[4] reported that combinations of propylene glycol, wetting agents, surface-active agents, and solvents, as vehicles for metallic salts, allergens, and sulfonamides, achieved speedy penetration of living skin. Following this, studies were undertaken to prepare a penetrating sulfur ointment for treatment of skin diseases. Usual mixtures of sulfur or sulfides and propylene glycol are insoluble. However, during the course of the work, a process was perfected by which calcium polysulfide could be put into solution at 1½ per cent concentration in propylene glycol. A lotion, prepared with polysulfide-propylene glycol solution, a wetting agent, and an antiseptic, was used successfully on human beings. Results showed that the free sulfide readily removed dead epithelium and destroyed mites. The wetting agent, in combination with propylene glycol, permitted deep penetration of the material. Because the propylene glycol was anhydrous, it dried skin lesions, and, contrary to oils and ointment bases, permitted air to reach the lesions. Hexachloro-dihydroxy-diphenyl-methane, a highly effective antiseptic, in combination with the

Fig. 1—Scabies in a 9½-year-old Chow. Before treatment (left); three months after initial treatment (right).

*Led-O-San, solubilized sulfur antiseptic veterinary. Registered in U. S. Patent Office.

other ingredients in the formula, gave the preparation fungicidal and bactericidal properties.

As diagnosis of skin diseases is difficult, a product with these properties is extremely useful. In experiments with dogs and cats, no irritation to the eyes or toxic symptoms were observed even when the entire body was treated with the preparation, and no gastrointestinal irritation followed when it was administered by mouth.

Clinical Use in Dogs.—A total of 52 dogs of all ages have been treated for various skin conditions with this lotion. Of these, 11 were cases of sarcoptic mange; in 5, the diagnosis of scabies was confirmed by demonstrating the mite in skin scrapings; a symptomatic diagnosis was made in 6; 6 were cases of ringworm, showing classical symptoms; the remaining 35 were diagnosed as chronic dermatitis, or eczema, 1 of which (a 6-year-old Pekingese) was in the terminal stage of acanthosis nigricans. With 2 exceptions, all cases were of six months' duration or longer, and, in several, the condition had been present for one and one-half to three and one-half years. All animals were in poor condition but with no recognizable complicating diseases or infections. In all cases, there was extensive loss of hair and marked skin involvement. Most of these animals had been treated with other preparations but had not responded.

Treatment with Polysulfide in Propylene Glycol.—According to the extent of the lesions, each dog was clipped, either entirely or in the areas involved. The animals were freed of fleas, bathed, and thoroughly dried. The lotion was applied to the affected areas, in some cases over the entire body, and was vigorously rubbed into the lesions until the medication was absorbed. It was applied daily, usually for one week, and, as the animals responded to treatment, the frequency of application was decreased to every other day or every third day. Treatment was usually continued for ten to twenty days.

Results. — Immediately following application, there was exfoliation of dead surface cells and the area appeared reddened. Pruritis ceased at once. In moist eczema, the "weeping" ceased after one or two applications. There was abundant exfoliation of dead skin from scabbed and thickened areas after each treatment. There was no irritation. Thin, normal skin remained, and regrowth of hair took place, in many cases, in ten to twenty days.

CASE REPORTS

Chow, Male, 9½ Years Old.—This dog had been treated with various preparations for three months. When presented for treatment, the lesions covered the face, ears, and forelegs. The diagnosis of sarcoptic mange was confirmed by miscrosopic examination. The lotion was applied daily for twenty days, then every other day, and every third day as the condition improved. Exfoliation was evident after the third treatment. After twenty days, marked improvement was noted and the skin was normal (fig. 1).

Cocker Spaniel, Female, 4½ Months Old.—For three months, this puppy had been treated for pruritis and eczema with lotions and ointments. When presented for treatment, it was thin and irritable. There was marked pruritis and violent scratching,

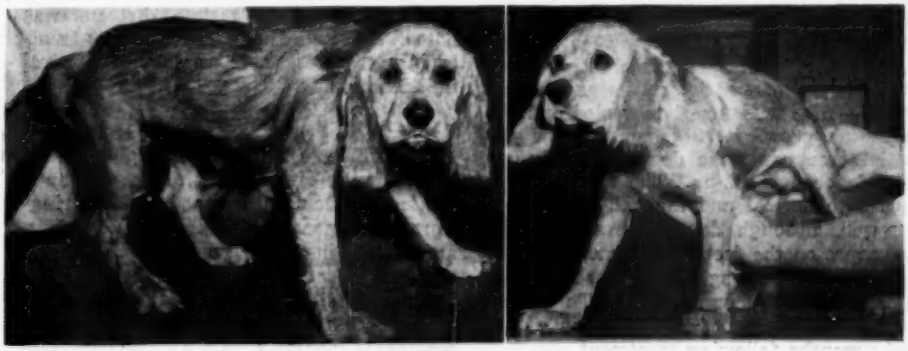

Fig. 2—Scabies in a 4½-month-old Cocker Spaniel. Before treatment (left); two months after initial treatment (right).

with the head, forefeet, legs, and abdomen involved. A symptomatic diagnosis of sarcoptic mange was made. The lotion was applied to the entire body once daily for four days, and to only the affected areas for eight additional days. At that time, there was marked improvement and hair growth had started. Four weeks after the initial treatment, the dog was returned for a check-up. All symptoms had disappeared and hair was growing well. The dog was bathed at this time, and one final treatment was given (fig. 2).

Irish Setter, Male, 3½ Years Old.—This dog was presented with a history of chronic dermatitis of approximately three years' duration, with pustules and scabs on the face, legs, feet, and body. Routine skin treatments had been used with no effect. X-ray therapy by a dermatologist (physician) was tried with marked improvement after four or five treatments. However, within one month after discontinuing treatment, the condition recurred. *Staphylococcus albus* was isolated from exudate, and an autogenous bacterin was produced, but no beneficial effects followed its use. Penicillin therapy was applied for several weeks with some apparent improvement, but there was recurrence of the condition when treatment was discontinued.

On presentation for treatment, there were scabs and pustules on the face and feet, thickened skin on the flanks, acanthosis nigricans on the right flank, and marked pruritis. Although the microscopic examination for mites was negative, the general condition and location of the lesions suggested chronic sarcoptic mange.

The treatment was applied and exfoliation was evident on the fifth day. On the seventh day, the dog was released and the lotion was dispensed to the owner for use every other day. Upon examination three weeks later, marked improvement was apparent. All the lesions had healed and the hair was growing. Six weeks after the initial treatment, the dog was again returned for a check-up. The skin had returned to normal and the hair was growing well, although there were a few hairless areas on the feet. The owner reported occasional scratching which ceased on application of the preparation. There has been no recurrence of the condition within eight months following treatment.

Mongrel, Male, 7 Years Old.—This dog was presented for treatment with a history of chronic dermatitis and eczema of one-and-a-half-years' duration. There were hairless areas totaling about half of the body surface and the skin was red and thickened to a depth about ¾ in. over the loin, back, and at the base of the tail. The routine treatment was applied. Fourteen days after the start of treatment, a benign fibroma about 2 in. in diameter was removed from the back. Healing was by first intention, and there was no interruption of treatment for the skin condition. Less than one month after the initial treatment, the skin was soft, pliable, and normal, and the hair was growing well.

Ringworm in Dogs.—Six cases of ringworm have been treated with the preparation, which was applied to the affected areas once daily for seven days. Scabs were not removed before application of the preparation, as is necessary with the usual treatments. In each case, the lesions were healed at the end of the treatment period and hair regrowth was complete one to two weeks later.

Cats.—Two male cats, 4½ and 8 months of age, with lesions covering the head, ears, neck, and front feet, were presented for treatment. The diagnosis of sarcoptic mange was confirmed by demonstrating mites in the skin scrapings. The lotion was applied in the usual manner once daily for four days, three times every other day, and twice every third day. Exfoliation took place within twelve hours after the first application. At the end of the treatment, skin scrapings were negative, the skin had become soft, and normal hair growth followed. In the normal process of grooming, it is presumed that some material was taken internally, but no gastric distress was noted. Although the entire head was treated in both cases, there was no conjunctival inflammation.

DISCUSSION

Polysulfide in propylene glycol has proved an effective parasiticide and antiseptic for the treatment of scabies, ringworm, and nonspecific dermatitis in dogs, and scabies in cats. Several of the animals reported here had received other therapy for long periods, with only temporary or no relief; they would normally have been considered incurable. In my experience, cats respond more speedily to this lotion than

any other; also it is superior because it is not toxic.

Exfoliation of dead surface cells, *i.e.*, chronically thickened skin, scabs, etc., and softening of the skin and hair regrowth followed its use. The material was deeply penetrating even on waxy and oily skin surfaces. Ectoparasites, particularly mites, were killed, and fleas and lice were apparently discouraged. As the preparation is anhydrous, moisture was taken up from the skin lesions. The growth of bacteria and fungi was inhibited. At no time were there any signs of toxicity, inflammation of the eyes, or loss of appetite, even when the material was applied over the entire body.

The preparation was easy to apply and tended to become gummy when allowed to dry on skin and hair. By removing any excess remaining on the hair, furniture coverings, rugs, and clothing were not stained by it. Therefore, the preparation may be dispensed by a veterinarian, and he can be assured that treatment will be continued at home. Although the sulfide odor was quite apparent when the preparation was first applied, it soon disappeared. In all treatments, the preparation was applied with unprotected hands. No uncomfortable sensations or damage to the skin were noted, and the hands were easily cleansed with water.

SUMMARY

1) The treatment of sarcoptic mange in dogs and cats, and ringworm and eczema in dogs, with polysulfide in propylene glycol is described.

2) The diagnosis of sarcoptic mange in 5 dogs and 2 cats was proved by demonstrating the mite in skin scrapings.

3) Exfoliation of dead skin followed the use of the lotion. Softening of the skin, and hair regrowth were apparent in one to three weeks.

4) The preparation was nontoxic for dogs and cats even when the entire body was treated.

5) The lotion was nonirritating to the skin when applied with unprotected hands, and was easily removed with water.

6) The material did not stain furnishings if excess was removed from the hair of the animal.

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How Bovine Leptospirosis Spreads

Spontaneous nasal inoculation should not be overlooked as a possible means of entry for the spirochete of bovine leptospirosis, Baker and Little believe (*J. Exp. Med.*, Sept. 1, 1948). The organisms eventually localizes in the kidney, and contaminated urine excreted on a concrete barn floor may create a spray that could be inhaled by nearby animals. Thus, it would be possible to spread infection through the entire herd.

Blood-sucking insects also may figure in its spread, inasmuch as the infective agent is present in the blood during the early stages. Baker and Little were able to produce the disease by subcutaneous inoculation—a fact that lends further weight to the possibility of insect transmission.

A more obscure, though plausible, theory is that infection may occur through ingestion. The investigators found the organism in milk, but test calves fed the milk did not become infected.

Experimental infection of cattle produced inapparent infection with normal urine in some cases, fever with albuminuria (the usual symptoms) in others, and a few cases of hemoglobinuria that terminated fatally.

Report No Carrier Danger with New Leptospirosis Vaccine

Because recovery from leptospirosis leaves most animals as carriers, it was feared that an immunizing agent might do likewise. But this is not the case, the National Canine Research Foundation reports (*Am. Ken. Gaz.*, Oct., 1948)—at least, not with a newly developed vaccine now being tested under Foundation supervision. The new product gives immunity "for quite a few months," it is stated. "During that immune period, even when inoculated with the disease, the animal does not get the disease, and so can not and does not become a carrier," the report concludes.

Outbreak of Calf Diphtheria Controlled with Sulfamethazine

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THIS paper reports an outbreak of an acute, infectious, highly fatal disease in feeder cattle involving the throat and the upper respiratory tract.

In the early winter of 1947, 1,800 head of a total shipment of 5,300 head of good grade white-face southern cattle arrived at a large ranch in Montana. Approximately 1,000 head had a difficult time en route, and, on arrival, were met by a mountain snowstorm. Acute Pasteurella pneumonia set in and losses did not diminish for a week.

The remainder of the shipments were stopped en route where the cattle were sorted. Those in proper condition and size continued the journey. The younger cattle and those showing symptoms of shipping fever were held. Corynebacterium-Pasteurella antiserum was administered in recommended dosage, and medicated water was given. All cattle were shipped as soon as the ranch could handle them. By the third week of November, the losses from pneumonia had stopped, but the resistance of the animals was dangerously low. From that time through the first week of December, another storm took its toll of the cattle that had not had sufficient time to build up resistance.

On December 15, the herd was observed by officials of the Montana Livestock Sanitary Board and one of the authors. The snow had disappeared and the weather was mild enough to thaw by 10 o'clock in the morning. The temperatures at night ranged between 10 and 20 F. Some pneumonia remained, particularly in the smaller calves; the physical condition of the entire herd was poor, and calf diphtheria was in evidence. Affected animals were isolated and routine treatment was instituted. Two days later, the disease seemed to be getting out of hand, and sulfamethazine was administered.

ORGANIZATION OF HANDLING

The organization and handling was the work of the ranch foreman, and the success of treatment admirably reflects the successful handling of this large number of animals.

The cattle were divided into eight feedlots, except that 865 adults were in an open pasture. The feedlots were located in two groups of three each and one group of two. The most central feedlot of each group was converted into a hospital pen into which was constructed the necessary facilities for handling the sick cattle and eliminating those that required no further treatment.

In the lots that were not being used for hospital pens, the feed bunks were put together at one end and fenced. Leading from each of these enclosures, another short chute was built with a "cutting" gate and a catch pen where sick cattle could be held (fig.1). As all cattle were at the feed bunks in the morning when they were fed protein concentrate pellets, this facilitated segregating the sick cattle. As the cattle were released from the enclosure to eat hay, a herdsman "cut out" all cattle that showed clinical symptoms or were abnormal. They were then taken to the hospital pens for examination and treatment.

The disease was probably spread by the use of feed bunks and the handling of all cattle through a common chute. However, two things stood out as being imperative for the control of the outbreak: (1) to build up the resistance and strength of the animals, and (2) to handle them as rapidly as possible with the least possible effort.

After each day's handling, the feed bunks,

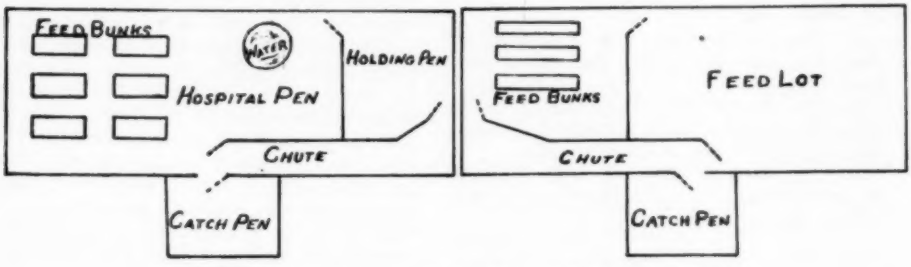

Fig. 1—Sketch on pen arrangement—hospital pen (left); feedlot (right).

the walls of the cutting chutes, and the chutes used for treatment were disinfected with a saponified cresol solution, using hand pump sprayers. All salt blocks were removed from the pens.

All feedlots were supplied with running water. In each hospital pen, stock tanks with heaters were used, and a good general stimulant and tonic was added to the water.

SYMPTOMS

In approximately 66 per cent of the animals treated, there were typical, caseous, diphtheritic ulcers, the majority of which were located just lateral to a lateral incisor; in fact, several hundred calves lost two or more of their incisors. Ulcers were also seen at the base of the incisors, on the hard palate, and on the tongue. In addition to these ulcers which were easily found, the lesions had frequently spread to the larynx and along the ramus of the mandible. There was, also, the characteristic salivation and nasal discharge.

In the 34 per cent without visible evidence of ulceration, it was important to know whether diphtheria alone was present, or whether there was some recurrence of pneumonia. Undoubtedly, some suffered from pneumonia alone, while in others both diseases were present. It is estimated that less than 200 of the total of 2,785 animals treated showed any recognizable symptoms of pneumonia at the time of treatment. As calves were cut out on general appearance of sickness, it is believed that many of these animals were treated in the initial stage of diphtheria. From observation and the animals' history, it is our opinion that two to five days elapsed after infection before ulcers and drooling became evident.

TABLE I—Distribution of Animals at Start of Outbreak of Calf Diphtheria and Number Treated

Group	Total cattle	Pen (No.)	No. in Pen	No. sick at start of outbreak	Total treated in course of two weeks
A*	1,520	1	570	200	1,075
		2	500	25	
		3	450	25	
B**	1,000	1	550	100	620
		2	450	100	
C†	1,575	1	700	60	1,090
		2	375	150	
		3	500	25	
Totals	4,095			685	2,785

*Treatment instituted December 18.
**Treatment instituted December 19. This group contained the majority of the weakest.
†Treatment instituted December 21, three days having elapsed from start of outbreak.

When the animals were originally examined, before the severe outbreak, temperatures of animals showing typical symptoms ranged from 104.5 to 106.0 F. However, because of the large number of animals involved thereafter, temperatures were not recorded.

TREATMENT

A total of 2,785 cattle were treated in the course of two weeks. Table 1 shows the distribution of the animals, the number sick at the start of the outbreak, and the number of animals treated in each group. About 25 head had been lost before treatment was started, and an additional 30 after the start of treatment. Approximately 125 head treated were cattle more than 1 year old.

A crew of three men was assigned to each hospital pen. After the calves were run into the chute, the mugger held open the mouth of each calf while the swabber cleaned and swabbed each visible and easily accessible ulcer. The mugger wore rubber gloves under soft leather work gloves saturated with iodine in an effort to reduce the transfer of the infection, or injury to the mouth at the point of contact. The swabber was instructed to clean out all visible and accessible ulcers only, and to remove obstructions such as hay from the throat.

One 15-Gm. oblet of sulfamethazine (approximately ¾ gr./lb. of body weight) was then administered with a balling gun once a day for two days. The gun was disinfected after its use on each calf with a dilute saponified cresol solution. Each calf was marked on the forehead with iodine to designate the first treatment and, similarly, across the nose for the second treatment.

RESULTS

Dramatic results followed the use of sulfamethazine. In other outbreaks, where local treatment was instituted, similar results were never experienced. In twenty-four hours, clinical improvement was apparent and appetites were improving. The ulcers took on a healthy, red, granular appearance. After the second treatment, appetites returned to normal, and the ulceration showed remarkable resolution. The cattle were then turned out of the hospital pens into the regular feedlots.

Toward the end of the outbreak, animals were treated with sulfamethazine alone, and the results were as satisfactory as in animals receiving local treatment in addition.

Some relapses were expected among these cases that were treated only twice and then

turned out of the hospital lots. However, it was necessary to re-treat fewer than 50, and an uneventful recovery followed. The ranch foreman observed that many of these animals failed to retain the drug administered and coughed up the oblet after being turned out of the chute immediately following treatment.

DISCUSSION AND CONCLUSIONS

Sulfamethazine proved to be an exceptionally effective drug in the treatment of this outbreak of calf diphtheria. It was evident, by observation, that treatment once daily for two successive days resulted in uneventful recovery.

Excellent results were obtained in the control of the disease even though the average dose used was lower than that usually recommended. Since the degree of susceptibility of the host, or the activity of the sulfonamide against the pathogen was not determined, it is entirely possible that the number of relapses may have been fewer had maximum dosage been administered in all cases. Some of the calves were very small, others weighed up to 350 lb., and about 125 head treated were more than 1 year old, but the same dose was used throughout the herd. Dosage, therefore, probably varied from a low of ¾ to a high of 1½ gr. per pound of body weight. For the initial dose, 1½ gr. per pound would have been optimum. As the animals treated were in all stages of the disease and many cases were of a very malignant type, a higher dosage probably would have resulted in more rapid recovery.

There were, undoubtedly, some pneumonic complications, but the majority of the sick calves were affected with calf diphtheria. However, those which may have had pneumonia, as a complication or independently, responded equally well to sulfamethazine treatment.

SUMMARY

1) The use of sulfamethazine in the treatment of an outbreak of diphtheria in 2,785 of a total of 4,095 calves and feeder cattle is described.

2) Typical diphtheria lesions were present in 66 per cent of the treated animals; 34 per cent were believed to be in the initial stages of the disease, some, undoubtedly, complicated with pneumonia still present from an outbreak following shipping.

3) The drug was administered orally, once daily for two days, to each calf. Dosage varied from ¾ to 1½ gr. per pound of body weight.

4) There was complete recovery in 99 per cent of the animals treated. There was recurrence of the disease in 1.8 per cent, all of which recovered after re-treatment.

5) There were no toxic reactions in any of the animals treated.

Relative Merits of Swine Ascaricides

Oil of chenopodium is about 75 per cent effective against swine ascarids, but it has the disadvantage of requiring preparatory fasting, purgation, and individual dosing, not to mention that its active principle (ascaridol) varies in different batches, a factor that accounts for deviations in both efficacy and toxicity.

Santonin is expensive and the results are disappointing with the dosage usually recommended.

Phenothiazine, once much in favor because it is easy to give and safer than oil of chenopodium, proved to be less than 50 per cent effective, and experience showed that swine are more susceptible to intoxication from it than other species.

Sodium fluoride, proved safe through American and Australian research, is more than 95 per cent effective against ascarids, and it drives out stomach worms simultaneously, at low cost. At the recommended therapeutic level (1 part in 99 parts of dry, ground feed, by weight, for one day), it creates its own barrier against its potential toxic effects by causing vomiting in many cases. While smaller doses may have equal ascaricidal value, there is the risk of sacrificing this natural protection against poisoning. There is also serious risk in giving this drug in any way differing from the dry-feed method. In garbage, slop, milk, capsule, or drench, it is likely to cause serious intoxication.—*Auburn Vet., 4 (Fall, 1947): 15-16 and 32-33.*

Bloat-Preventing Roughage.—In feeding tests made at the New Mexico experiment station, cottonseed hulls, corn silage, or hegari, combined with alfalfa hay as the roughage in cattle-fattening rations, effectively prevented bloat which often occurs when alfalfa is fed as the only roughage.

Pigs that are healthy, thrifty, and well-grown should be castrated at 4 weeks, vaccinated at 8 weeks, and marketed at 6 months.

Tyrothricin-Benzyl Benzoate in Veterinary Practice

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THE USE of benzyl benzoate in the treatment of scabies in man and animals has been reported by many investigators and clinicians. Several reports on the use of tyrothricin-benzyl benzoate mixture* for human beings have appeared recently in the literature.[1,2]

It is the purpose of this article to report observations and results obtained through the clinical use of a tyrothricin-benzyl benzoate mixture in veterinary practice. The preparation used contains:

Tyrothricin	0.05%
Benzyl Benzoate	30.0 %
Benzocaine	3.0 %
Alcohol	62.0 %
Distilled water and flavoring agents	*q.s.*

This mixture is easy to apply to affected areas, even on dogs with long hair. It has a spreading action and, when properly applied, a small amount will cover a wide area.

This report is not confined to the use of the mixture as treatment for scabies in dogs. It also includes observations on its application in parasitic conditions in cats, rabbits, and birds, as well as nonparasitic dermatoses in dogs. We have used the tyrothricin-benzyl benzoate preparation for approximately four years.

At an early date, we discovered that the mixture was beneficial in the management of nonparasitic dermatoses in dogs and, therefore, this series includes many such cases.

PARASITIC DISEASES

Sarcoptic Mange in Dogs.—A positive diagnosis of scabies is made only when we can demonstrate the mange mite by microscopic examination of the skin scrapings and never on the basis of gross skin lesions alone. Sarcoptic mange in dogs is not frequently observed in our practice.

We have used tyrothricin-benzyl benzoate mixture in the treatment of 3 cases of scabies in dogs. Improvement of these cases was noted within several days and complete recovery in a week to ten days. In the treatment of scabies in the dog, it is important that all dry exudate and encrustations be removed with warm soapy water before treatment.

Ear Mites in Dogs.—We have treated 28 cases. A medicine dropper full of the tyrothricin-benzyl benzoate mixture was applied into the ear canal followed by vigorous massage of the ear. The debris, of which there was usually a considerable quantity, was removed with dry cotton on either an applicator stick or thumb forceps. This was followed immediately by another application of the mixture which was permitted to remain in the ear canal. Several such treatments at two or three day intervals invariably cleared up the condition.

Ear Mites in Cats.—Seventeen cases were treated. The same procedure was followed as in dogs, but the amount of the tyrothricin-benzyl benzoate mixture was limited to 5 or 10 drops. Benzyl benzoate, when applied in large amounts, is somewhat toxic for cats. In the 17 cases treated with these small quantities, we have, however, not observed any untoward reactions and the results were satisfactory.

Ear Mites in Rabbits.—Twenty chinchilla rabbits maintained in a commercial rabbitry suffered from an ear disturbance. Acariasis was diagnosed. Treatment with tyrothricin-benzyl benzoate in a manner similar to that used on cats corrected the condition within one week.

Scaly Leg or Foot Mange in Birds.—Tyrothricin-benzyl benzoate mixture was used in the treatment of this condition in 2 canaries, 3 homing pigeons, and 35 chickens. The condition was corrected with from two to three applications at two- or three-day intervals. Cleansing the affected parts with soap and water before treatment is important.

NONPARASITIC DERMATOSES IN DOGS

As stated above, we observed that the tyrothricin-benzyl benzoate mixture was of value in the treatment of skin conditions other than those caused by parasitism in

*The tyrothricin-benzyl benzoate mixture is identified by the term "Tyroscabe," and was furnished by the medical research division, Sharp and Dohme, Inc., Glenolden, Pa.

the dog. Because of the nature of etiologic factors in most nonparasitic dermatoses, we feel that this medicament serves as an adjuvant to other remedies or corrective measures.

In the following discussion and classification, no special attempt is made at pathologic diagnosis, and only suggestions as to etiologic diagnosis. We believe this is necessary because of the obscure nature of many skin conditions, and because of the lack of uniformity in terminology and nomenclature among clinicians. We shall, however, attempt to convey some idea as to the types of skin ailments in which the mixture is of value by giving a description of the appearance of the skin and a statement regarding the types of patients that were treated.

Our use of the mixture has been confined almost entirely to cases in which only the superficial layers of the skin were involved. From the standpoint of an inflammatory reaction of the skin, appearance ranges from a normal color to extreme redness of the integument. Upon close observation, a roughness of the epidermis can be detected where erythema is present. The roughness tends to disappear as the condition improves, and is usually followed by a scaly desquamation. As indicated, some of the cases when brought to us show no redness but these usually are scurfy. In almost every case, there is some degree of depilation, varying from a slight thinness of hair to complete baldness in areas of varying size. In most cases, there is considerable pruritis as evidenced by the dog's scratching. Sometimes this is the only symptom. In some cases, however, pruritis is absent, especially where there is a pale, dry skin. We have used the tyrothricin-benzyl benzoate mixture less extensively in suppurating dermatitis and moist eczema than in the chronic dry type.

The above discussion may seem to be quite elementary and superfluous. However, we hope that this, together with an attempt to classify the cases as follows, may assist in explaining the types of cases in which we have used this treatment advantageously. Environment, feeding, care, and management of the dogs, of course, also must be taken into consideration.

Dermatosis in Dogs Fed Meat-Free Rations (103 Cases).—Among this group were beagles, foxhounds, coonhounds, pointers, setters, and large farm dogs. It is obvious, of course, that in this group proper feeding is frequently impossible because of cost, or even unavailability, of proper food. Lack of information on the part of the owner regarding nutritional requirements for the dog also is a common factor. Cases in this classification are quite common, and for convenience we frequently refer to them as "corn-bread eczema."

Chronic Dermatitis in Overfed Dogs (68 Cases).—In this group, we often find no lesions except those produced by scratching. The hair may be dry with some scurf, especially on the back. Pruritis, indicated by vigorous scratching, is a rather constant symptom. This is the type of case that frequently develops into moist eczema. We believe that the tyrothricin-benzyl benzoate mixture will prevent the development of this stage. However, after it has developed, we find that other remedies are somewhat more effective.

Dermatosis in Tender-Skinned Dogs (39 Cases).—The reason for including this classification is that we frequently observe such dogs with varying degrees of skin irritation, especially on the lower abdomen where the hair is thin or absent. We believe that many of these cases are contact dermatosis. We have observed cases where a rug was found to be the source of irritation. In some cases, the irritation of the skin develops where the dog has been in contact with certain weeds or grasses. There is also the possibility of a fungous dermatitis. These cases usually are characterized by small, reddish, circumscribed areas of the skin, and they generally responded to therapy with the tyrothricin-benzyl benzoate mixture.

Internal Parasitism in Dogs (40 Cases).—Dogs with intestinal parasitism, especially tapeworms, frequently show a diffuse dermatitis quite similar to those cases resulting from nonmeat diets in the first group. There is little doubt that the skin lesions in these cases are a manifestation of an allergic reaction to the toxic substances produced by the parasites. Thirty-six cases were treated.

A similar clinical picture is sometimes seen in dogs with heartworms (microfilariasis). Four cases were treated. These cases received specific treatment for parasitism as well as local applications of the tyrothricin-benzyl benzoate mixture.

Miscellaneous (13 Cases).—This group includes those cases that are not mentioned in the above classifications. The dog may have received a good diet, is not too fat, is free of parasitism, and has no

history of a contact irritation. However, to say there is no history of contact irritation is almost meaningless in the light of our increasing knowledge of the vast possibilities of allergic manifestations. We find these cases most frequently in short-haired terrier types. Usually, there is considerable loss of hair with scurf, and often very little discomfort to the animal. Tyrothricin-benzyl benzoate preparation aided greatly the treatment of these cases.

METHOD OF TREATMENT

The tyrothricin-benzyl benzoate mixture can best be applied to the skin either with a medicine dropper or a small, single-opening sprinkler top. A small hole punched into a screw cap serves very well. Only a small quantity is necessary to cover a relatively large area. The application is followed by massage. One application daily is usually sufficient. In cases where there is much itching, two or three applications daily may be indicated. Desquamation may follow treatment in several days. These scales are removed before another application is made. When the scurf is difficult to remove, the solvent action of the preparation is helpful in removing it. Treatment is continued as long as necessary. In four or five days, considerable improvement usually is noted. This is indicated by a lessening of the amount of desquamation although, at first, this may be increased. There is also a softening of the skin, an increase in the luster of the haircoat and, in time, a new growth of hair in areas where it had been lost. The most important improvement, both for the patient and the owner, is a noticeable alleviation of pruritis in those cases where it was the chief symptom.

DISCUSSION AND SUMMARY

We realize that the above classification of nonparasitic canine dermatoses is by no means complete. However, it is a satisfactory and practical classification for our purposes at the present time. In the treatment of nonparasitic skin diseases in dogs, the tyrothricin-benzyl benzoate mixture serves as a useful adjuvant to other remedies and corrective measures. This preparation is helpful, especially in the baffling cases which we all face frequently and where other preparations often fail.

A limited number of cases of scabies in dogs, cats, rabbits, and birds were treated successfully with the antibiotic-scabicide preparation.

The tyrothricin-benzyl benzoate mixture is easily applied. The physical property is such that it spreads rapidly and smoothly, and, therefore, only a small quantity is necessary to cover a relatively large area. It is effective in breaking up skin debris, which is helpful in many cases. This is particularly true in conditions involving the ear canal. We use the preparation not only in the treatment of infestations due to ear mites, but also in dermatosis of the auditory canal.

The aroma and consistency of the tyrothricin-benzyl benzoate mixture is not objectionable, as is the case with many preparations designed for the treatment of skin conditions, especially ointments and emulsions. For this reason, the preparation is suitable for dispensing and for use on house dogs.

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Swine Erysipelas

The live-culture-antiserum vaccination of 8,000,000 hogs against swine erysipelas in the last ten years (*Hog Breeders*, Aug., 1948) was the largest, single, disease-control experiment in American livestock history. The disease is costing millions of dollars in pig losses annually. Its control is a "must" in the pig-breeding industry, this leading swine magazine tells us.

Swine erysipelas is one of the penalties the Middlewest farmer is paying for the everybody - his - own - vaccinator system of controlling animal diseases when the Farm Bureau Federation was learning its trade.

Maneuvering veterinary practitioners off the farm thirty years ago was not as wise as it was supposed to be. There was a time, not so long ago, when swine erysipelas might have been exterminated in the United States. It is too late now. Cheap as "I-told-you-so" is, that hackneyed saying is always in order when the object is to make the nation secure.

Bovine Ocular Epithelioma.—Sunburning of continuously moist, nonpigmented areas of the lower eyelids is believed to be a predisposing cause of cell derangement, ulceration, and benign neoplasms. These growths may become malignant in Hereford cattle.—*J. Anim. Sci., Nov., 1948.*

Three Cases of Dystocia

X Disease Possible Cause. — Between Sept. 13 and Oct. 21, 1948, 2 heifers and a young cow, all within one to four weeks of the termination of a normal gestation period, attempted to calve. In each case, the animal seemed normal except that the fetus

Fig. 1—Possible hyperkeratosis of 350-lb. steer calf.

had recently died and the genital tract was unrelaxed. Each required an embryotomy and a forced extraction, but little, if any, injury to the heifers resulted. However, in each case, the female soon appeared ill and 2 died in sixty hours and the third was condemned on the fifth day. None appeared to develop much infection. Only 1 was tested, but she was negative to brucellosis.

Poisoning or some other unusual cause for the abortion and death was suspected. Upon examining the balance of the herd of 8, symptoms of hyperkeratosis were found on 2 cows and a 350-lb. steer calf—the latter having exhibited a rough skin for five or six weeks.—*W. A. Aitken, D.V.M., Merrill, Iowa.*

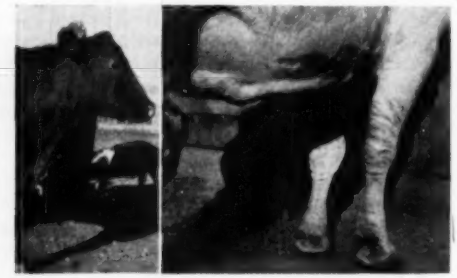

Fig. 2—Early lesions on cheek and neck of one of the cows with symptoms of hyperkeratosis (left), and on volar surface of forelegs of another (right).

Insect Egg Mass Reaches U. S. on Airplane Wing

Discovery of an insect egg mass (Phalaenidae) on the wing of a Brazilian plane, traveling a multi-stopover route to the United States, has amplified the fear that viable disease agents, especially parasites dangerous to crops, animals, and human beings, may be transported accidentally from one nation to another on the outside of aircraft.

According to a report by federal authorities (*Public Health Reports*, Oct. 22, 1948), wind pressure, altitude, and temperature changes had no adverse effect on the viability of the eggs, since they hatched after arrival. Conceivably, insects could hatch from eggs transported in this manner, fall to the ground while the plane is in flight, and pursue a destructive course in their new habitat.

The lepidopteran egg mass was detected during routine federal sanitary inspection of the Brazilian plane at the International Airport, Miami, Fla.

Diagnosis of Feline Panleucopenia.—A diagnosis of panleucopenia can be made in cats when a significant decrease of the white cells is associated with fever. The early febrile stage may show no appreciable leucopenia.

In the differential diagnosis of enteritis and panleucopenia, reaction to water may be revealing. Dehydration from vomiting and diarrhea in enteritis has led many kittens to crawl into water and drown.—*Austral. Vet. J., Sept., 1948.*

Lambs born of ewes immune to louping ill acquire a humoral immunity lasting up to three months. Their antibody levels closely correspond to those of the ewes.—*J. Comp. Path. and Therap., July, 1948.*

Cold weather may play some part in the etiology of bovine pyelonephritis. Penicillin alone or in combination with sulfonamides is a promising and economically sound treatment for valuable purebred animals in the early stages.—*Kiesel et al., New York State Veterinary College.*

Electrical Intraneural Bipolar Stimulation of Peripheral Nerves in the Dog

MARK W. ALLAM, V.M.D., FRANK E. NULSEN, M.D., F. H. LEWEY, M.D.

Philadelphia, Pennsylvania

IN VETERINARY practice, the question of ascertaining the extent of peripheral nerve injury is of increasing importance, especially in foreleg injuries. While various methods have been adopted for examining human patients, none has been applied to the animal.

Electrical stimulation with the help of electrodes placed on the skin has been used to determine the functional status of the neuromuscular apparatus.[2] This method causes mass contraction of muscles in the case of a regenerating nerve, which is much less irritable than normally and requires a higher intensity of current. The contraction of adjacent muscles can be avoided by contacting the nerve more directly. Nulsen and Lewey[1] have devised an aid in the assessment of nerve injuries by use of intraneural bipolar stimulation.

TECHNIQUE

Two sterile, 25-gauge hypodermic needles are inserted through the sterilized skin in contact with or near the nerve in question, and at an area well defined by surface topography. A direct or indirect electric current of 3 to 5 milliamperes is sufficient. An effective and more simplified method of supplying the current may be had by using a 1½-volt dry cell battery in an ordinary flashlight constructed with special adaptors to attach the needles. The current is gradually increased as the examiner attempts to estimate the presence or absence of motor response. Even though the cutaneous landmarks of the nerve can be fairly well determined, in the case of a negative motor response it would be well to vary the position of the needles several times to preclude the possibility of poor contact with the nerve. There is apparently no harm to the nerve tissue by this direct contact with needle and current. It is necessary to understand the cutaneous locations of the various nerves for intraneural stimulation and the muscular response anticipated.

INTRANEURAL STIMULATION AND MUSCULAR RESPONSE

In the foreleg of the dog, the important nerves for consideration are the radial, median, and ulnar; in the hind leg, they are the sciatic, tibial, and peroneal.

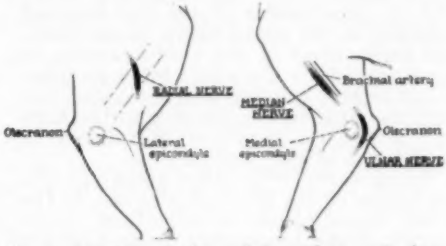

Fig. 1—Location of the radial, median, and ulnar nerves in the foreleg of the dog.

Radial Nerve.—The radial nerve (fig. 1), the largest emanating from the brachial plexus, sinks into the interval between the long and medial heads of the triceps at the distal border of the teres major and spirals around the humerus from the medial to the lateral surface.

For intraneural stimulation, this nerve may be palpated in the distal third of the humerus on its lateral aspect approximately 2 in. above the elbow joint. The examiner may also measure the distance from the olecranon to the acromion. One-half this distance measured from the olecranon upward on the lateral surface of the humerus will determine a place where the radial nerve will be easily felt under the palpating figure. Result of stimulation is dorsiflexion of the wrist.

Median Nerve.—The median nerve (fig. 1) is formed by its two divisions at a point approximately 1 in. above the elbow, and can be located on the medial surface of the arm by using the pulsation of the brachial artery as a guide. Result of stimulation is wrist and toe flexion.

Ulnar Nerve.—The ulnar nerve (fig. 1)

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Appreciation is hereby given for the assistance of Miss Elizabeth Fortune.

This study was aided in part by a faculty grant of the Committee for the Advancement of Research, University of Pennsylvania.

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[2]J. Marek, Klinische Diagnostik, Fischer Jena—1937, P. 465.

is somewhat larger than the median nerve and, in the area of the lower arm, passes along the surface of the medial head of the triceps, continuing distally posterior to the medial epicondyle of the humerus. At this point the ulnar nerve can be rolled under the finger. Result of stimulation is strong wrist flexion.

Sciatic Nerve.—The sciatic nerve (fig. 2), in its descent in the thigh, lies between the biceps femoris laterally and the semimembranosus and semitendinosus, medially. The nerve may be examined electrically by inserting the hypodermic needle 1 in. distal to the tuber ischii into the furrow formed by the biceps femoris and the semimembranosus and the semitendinosus. A 2-in. needle is required to contact the nerve at this point. Result of stimulation is flexion of knee, plus contraction of all calf muscles.

Peroneal Nerve.—The peroneal nerve (fig. 2), the smaller of the two terminal branches of the sciatic nerve, passes laterally under cover of the biceps femoris to curve around the fibula just below its head. It can be best palpated and stimulated just posterior and slightly superior to the head of the fibula. Result of stimulation is dorsiflexion of the foot and toes.

Tibial Nerve.—The tibial nerve (fig. 2), the larger of the terminal branches of the sciatic nerve, should be stimulated by insertion of the hypodermic needle into the popliteal space between the two heads of the gastrocnemius muscle. With the leg held at about 140 degrees flexion, this would be approximately 1 in. above the stifle within the popliteal space. Result of stimulation is flexion of the foot and toes.

CLINICAL REFERENCE

Case 11483.—A Labrador retriever, exhibiting a paralysis of the foreleg following trauma by an automobile, was presented for examination. This condition is commonly, but erroneously, referred to as radial paralysis. The shoulder muscles showed marked atrophy and a complete wrist drop was present. No muscular responses were obtained from electrical stimulation of the radial, ulnar, and median nerves, suggesting a diffuse high plexus injury or avulsion of the roots. Surgery was not recommended because of multiple nerve involvement.

Case 2349.—This dog developed a complete foreleg paralysis as the direct result of trauma by an automobile. One month after injury, with the clinical picture unchanged, he was examined by intraneural bipolar electrical stimulation. Both median and ulnar nerves responded normally, with limited response of the radial nerve. As a result of this examination, the owner was advised that it would require approximately one year before recovery could be anticipated. Actually, ten months after injury, this patient had regained practically normal function of the limb.

Case 12533.—The peripheral nerves of a 10-year-old Fox Terrier with complete paralysis of the hind legs were examined electrically. Movements of normal intensity were obtained by stimulation of the peroneal and tibial nerves; hence, the paralysis could not be explained on the basis of a lower motor neuron disease.

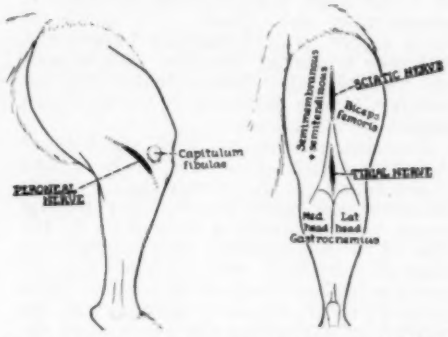

Fig. 2—Location of the peroneal, sciatic, and tibial nerves in the hind leg of the dog.

DISCUSSION

The ability of a certain nerve to respond can be determined in terms of motor function. If the regenerating nerve has reached one of its corresponding muscles, it may be possible to produce muscle contraction by nerve stimulation long before the dog can demonstrate voluntary function. The progress of regeneration can be followed as function becomes demonstrable in additional and more distal muscles.

Such information will be helpful in determining that nerve regeneration has taken place or is progressing. The conclusion would then be that surgical exploration is unnecessary, and that restoration of function will probably take place without surgical treatment.

SUMMARY

1) There is a definite need for a technique of examining the peripheral nerves in the dog without resorting to surgical exploration.

2) Electrical stimulation by the use of electrodes placed on the skin, thus producing the electric stimulus through the intact skin, may be inaccurate.

3) There is, apparently, no harm to

nerve tissue by direct contact with needle and electric current.

4) Surface topography enables the examiner to locate accurately the sites for peripheral nerve stimulation.

5) A regenerated nerve which has contacted its muscle will respond to electric stimulation several months before the patient can demonstrate voluntary contraction.

Notes from the Bovine Brucellosis Conference

The following are notes from the Conference on Bovine Brucellosis Research, held in Chicago Nov. 30, 1948. The Conference was sponsored by the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Report from the BAI, by C. A. Manthei, D.V.M., Beltsville, Md.

The degree of susceptibility to virulent *Brucella abortus* is similar in unvaccinated cattle between 2 and 7 years of age.

Brucella abortus recoveries from the blood were made from 2 of 18 heifers (11.1%) for twenty-one months following exposure; from the vaginal discharge from 3 of 18 heifers (16.65%) for the same length of time; and persistent udder infection was demonstrated in 13 of 18 heifers (72.0%) for twenty-one months.

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The agglutinin response reached its highest level at eighteen days in all groups following re-vaccination of calves.

When yearling heifers were vaccinated subcutaneously and intracutaneously, the maximum agglutination titer was 1:3,200 in the subcutaneous group and 1:6,400 in the intracutaneous group.

Two years following vaccination, the agglutination titer of the subcutaneous group had receded to 1:170 and of the intracutaneous to 1:180.

Report from the University of Connecticut, by E. L. Jungherr, D.V.M.

Brucellosis can be controlled by the systematic use of methods now available.

Vibrio foetus is second only to *Brucella abortus* as an infectious cause of abortion, "breeding trouble," and the low milk production which results.

The annual abortion rate from vibriosis may be as high as 20 per cent.

Report from the University of Maryland, by Cornelia M. Cotton, Ph.D.

Of the animals vaccinated intracutaneously during the fourth, fifth, or sixth month of age, 97.0 per cent were negative within a year, while only 86.0 per cent of those vaccinated subcutaneously were negative at that time.

Of the animals vaccinated intracutaneously at 7 or 8 months of age, 93.0 per cent were negative at the end of one year, while only 73.9 per cent of the subcutaneously injected animals were negative by that time.

The immunity developed in the animals vaccinated intracutaneously and subcutaneously appears to be about equal, judging by the natural infection which has appeared in the herds during the years of observation.

Of the 2,500 animals vaccinated as adults both intracutaneously and subcutaneously, about 10 per cent are negative at the end of a year, about 40 per cent have titers of 1:100 or greater, and the remaining 50 per cent have titers of 1:25 and 1:50. The titers tend to drop after the first year in both groups (intracutaneous and subcutaneous), but the decrease is equally slow in both groups.

When animals, vaccinated as calves, were re-vaccinated when 2 or 3 years old, titers of 1:500 or greater were produced. When the regular dose of vaccine was used, these titers were lost in three months. When reduced doses were used, the animals became negative sooner, frequently in less than one month.

Report from Purdue University, by F. V. Washko, D.V.M.

Exposure of cows by injection of *Brucella suis* through the teat canal into the milk cistern and/or smearing the teat orifice with *Brucella suis* resulted in active brucellosis in 6 out of 6 cows exposed.

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Milk from such *Brucella suis* infected cows, when fed to swine, resulted in active brucellosis in all 8 pigs in the experiment.

Distemper Immunization in Puppies

Pups cannot be successfully and permanently immunized against distemper until they reach the age of 3½ months. Until this time, they may be protected by injecting homologous serum at the rate of ½ cc./lb. of body weight every two weeks. When they are 3½ months old, vaccine is injected, and three weeks later, injections of Ashe Lockhart virus. An alternative treatment sometimes used is ½ cc. of virus at the age of 1 week, which is repeated when the pups are 5 to 6 weeks old.—*Dr. Clay C. Von Gremp, Georgia.*

NUTRITION

Urea In Livestock Feeding

JAMES S. DINNING, M.S., H. M. BRIGGS, Ph.D., WILLIS D. GALLUP, Ph.D., O. B. ROSS, Ph.D., L. H. MOE, D.V.M., and R. L. BUTLER, D.V.M.

Stillwater, Oklahoma

THE RECENT war years, and the resulting protein shortage, have stimulated interest in the use of urea as a potential source of protein for cattle and sheep. The results of many nitrogen balance studies[1-5] definitely indicate that addition of urea to the rations of cattle and sheep improves nitrogen retention. The results of growth studies are less clear cut. In recent studies, Schmidt and Kleisch[6] have reported that urea does not improve growth in calves, whereas Hart *et al.*[7] working with calves and Harris and Mitchell[5] working with lambs have arrived at quite the opposite conclusion. Urea has been used extensively in the rations of dairy cows and again investigators disagree as to its value in promoting milk production.

Wisconsin investigators,[8] and workers[9] in Scotland, have reported that urea is efficient in promoting milk production, while Bartlett and Blaxter[10] were unable to improve milk production by additions of urea to low or normal protein rations.

Although knowledge of the exact mechanism of urea utilization by ruminants is incomplete, it is generally agreed that microörganisms in the rumen make use of urea nitrogen to multiply and build their own body protein. This protein is then digested and the resulting amino acids absorbed by the host in the same manner as feed protein is digested and absorbed. Ammonia produced in the process of urea breakdown in the rumen may also be of some value to the animal, although large amounts are detrimental.

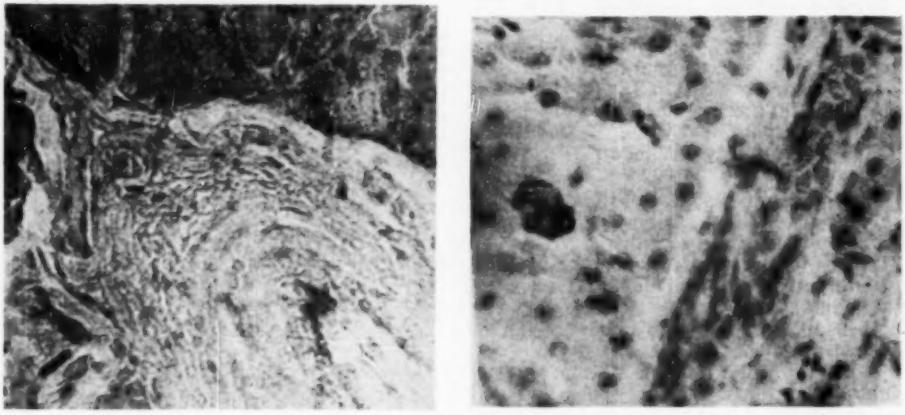

Fig. 1—Sections of kidney (left) and liver (right) taken from a steer which had eaten 400 Gm. of urea daily for seventy days. Stained with hematoxylin and eosin.

DISCUSSION AND RESULTS

Nitrogen balance studies have been conducted at the Oklahoma Experiment Station[11] to determine the value of urea when added to maintenance and fattening rations for cattle and sheep. Nitrogen retention was improved in steers when urea was fed

From the Animal Husbandry Department, School of Agriculture, Oklahoma A. & M. College, Stillwater.

at a level of 1.05 per cent of the dry matter in maintenance rations, and was improved in lambs when added to supply 2.42 per cent of the dry matter, the highest level at which it was fed.

It appears from a consideration of all the evidence that urea is of value as a protein substitute in rations for ruminants, and its use in practical feeding operations may be expected to become more widespread in the future. Knowledge of possible toxicity of urea, then, becomes a matter of importance to practicing veterinarians. Published reports and unpublished data from the Oklahoma Experiment Station indicate that both a chronic and an acute type of urea poisoning are possible.

The chronic type of urea poisoning has been induced experimentally and is characterized by diuresis and degeneration of the kidney tubules. Hart and coworkers[7] reported these symptoms when urea supplied 2.8 per cent of the dry matter intake of calves. Work *et al.*[12] fed urea to steers at a level to supply 2.29 per cent of the dry matter intake for 244 days and observed none of the symptoms of chronic urea poisoning. Briggs *et al.*[1] fed urea to supply 2.2 per cent of the dry matter intake of steers and observed no gross or histologic pathology.

In a previously reported study from the Oklahoma Experiment Station,[13] a 2-year-old Hereford steer was induced to eat 400 Gm. of urea daily for seventy days. The urea comprised 8.0 per cent of a mixture of cottonseed meal, hominy feed, and molasses. The intake of prairie hay by the steer was variable but it was estimated that urea comprised about 6.0 per cent of the dry matter of the ration. The steer was slaughtered at the end of the seventy-day feeding period and autopsy revealed no gross pathology. Sections of liver, kidney, heart, lungs, spleen, and pancreas were taken for histologic study. No histopathology was observed in any of the sections. Figure 1 shows sections of liver and kidney taken from this steer. The fact that this steer was fed for only seventy days may explain the absence of pathology as reported.[7]

Consideration of the results reported[7, 12] would indicate that when urea is fed for extended periods (more than 70 days), the level of feeding necessary to produce the chronic type of poisoning lies between 2.29 and 2.8 per cent of the dry matter of the ration. Under optimum feeding conditions, urea would probably never supply more than 2.0 per cent of the dry matter intake and the chronic type of poisoning should not be produced.

It has been demonstrated that urea is converted to ammonia in the rumen of cattle and sheep. If large quantities of ammonia are rapidly produced and absorbed, it might be expected to result in an adverse effect on the animal. The rapid absorption

Fig. 2—A steer thirty minutes after having been drenched with 250 Gm. of urea in water solution. The steer died twenty minutes later.

of ammonia seems to be the factor responsible for the acute type of urea poisoning.

The effects of orally administered urea on blood urea and ammonia levels in steers have been reported.[13] The urea solution was given by means of a stomach tube 25 cm. in length. When given in this manner, 57 Gm. of urea produced no ill effects in steers; however, dosages of 116 Gm. and larger amounts resulted in characteristic symptoms followed by death. Ataxia was evident within twenty minutes after the urea was given. The steers were down within thirty minutes and went into severe tetany. Respiration became slow and difficult with frequent gasping, and the steers exhibited excessive salivation with frothing. Death occurred at from forty to ninety minutes after the urea was administered. The fact that all the steers which exhibited the symptoms described also had very high blood ammonia values indicates that the symptoms observed were the result of severe alkalosis. The alkalosis was undoubtedly due to hydrolysis of urea to ammonia and subsequent absorption of the ammonia. The symptoms which have been described were produced in 7 steers and the syndrome was identical in every case. Seventy-five grams of a mixture of equal parts of calcium chloride, magnesium chloride, and dextrose was given intravenously

to 1 steer which had received 256 Gm. of urea in the manner described above. The tetany completely disappeared within fifteen minutes but the steer died one and one-half hours later. A recent report[14] has indicated that glutamic acid may act to detoxify ammonia; it may be of value in treatment of acute urea poisoning.

One steer was given 236 Gm. of urea in water solution by means of a long tube which could be palpated in the rumen. The animal did not display the symptoms observed in steers which had received urea by means of a short tube, but died seven hours later. Autopsy revealed severe inflammation of the wall of the rumen in the region in which the tube had been palpated. This might indicate that the urea given by the short tube had in part by-passed the rumen and the ammonia was rapidly absorbed from the lower stomach compartments.

In no instance was it possible to induce steers to eat a sufficient quantity of urea to produce the symptoms of acute urea poisoning. It is to be emphasized that the experimentally produced acute urea poisoning was the result of unnatural administration of large quantities of urea and should not be experienced under practical feeding conditions.

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Vitamin B_{12}—A Cobalt Complex

Vitamin B_{12}, newest of the B vitamins, is identified as a crystalline red compound highly active in producing hematologic responses in anemia cases, especially pernicious anemia (*Science, 108*, Aug. 6, 1948). Merck & Co. research workers say it appears to be a "cobalt coördination complex" and that its red color probably is associated, at least in part, with its cobalt-complex character.

Having proved the presence of cobalt in the newly isolated vitamin, the investigators pointed out that this "reflects significantly upon many biologic studies which have shown that cobalt is an essential trace element in nutrition, and perhaps upon suggestions concerning cobalt as a trace contaminant in iron therapy of anemias."

This view would indicate that the nutritional importance of cobalt in man and animals will have to be re-appraised as further studies shed new light on the biologic function of vitamin B_{12}. Another view prompted by the discovery of this vitamin is that the substance is identical with the much-discussed animal protein factor (*see*, the JOURNAL, Sept., 1948: 277).

Iodine Requirement of Chickens

Wilgren, Gassner, Patton, and Harshfield (*Poult. Sci.*, Sept., 1948) investigated the minimum iodine requirements of chickens through several generations, with special reference to the etiology of goiter. Among other evidence, the study revealed that the ration of chickens should contain 0.5 to 1.0 mg./lb. of feed. The minimum need appears to be 0.5 mg./lb. for the growing ration and 0.2 mg./lb. for laying hens.

It was observed that severe goiter did not impair general behavior, appearance, or the utilization of feed. Egg quality, size, and hatchability, or adult livability were not improved by raising the iodine intake from 0.8 mg. to 0.17 mg./lb. of ration, regardless of histologic evidence of goiter.

EDITORIAL

The Importance of Diagnosis

Successful veterinary practice rests upon accurate diagnosis, effective treatment, and appreciation of these factors by the client. Each is essential.

The greater emphasis over the years has been on treatment. This is logical, since the owner of an ailing animal wants something done to correct the abnormal condition and to bring the animal back to normal as rapidly as possible. The owner cannot appreciate the necessity for accurate diagnosis until this need has been explained to him.

The proper way to emphasize the need is to use some of the simple, practical, diagnostic aids. The regular use of the thermometer and the stethoscope can do much to impress upon the owner the necessity for specific information regarding the body temperature, the rate and force of the heart beat, the condition of the lungs, and the activity in various portions of the digestive tract. The owner feels that he is entitled to information gained from such examinations, and successful veterinarians have repeatedly said that the best results are achieved with the animals of those owners who understand clearly the nature of the ailment and the manner in which treatment may be expected to restore the affected organs to normal function.

The busy veterinarian, who does not explain to his client the basis upon which treatment has been selected, is encouraging the client to do more of his own treating in the future. Very often, this type of veterinarian is "too busy treating animals" to make a careful differential diagnosis, and therefore probably is not in a good position to explain to himself or to his client the reason for administering the treatment, nor to predict the response which may be expected. When questioned, the veterinarian may give answers which are general and vague, and the client is justified in assuming that the only information used by the veterinarian in making a diagnosis is identical with that which the owner used in arriving at his own conclusions.

Actually, the information acquired by the veterinarian is much more extensive, because he has been trained to observe the manifestations of physiological derangements, but, if no thermometer is used, how can the owner know that the veterinarian recognizes symptoms of elevated temperature? And if no stethoscope is used, how can the client appreciate the fact that the veterinarian has any knowledge of the conditions of the heart, the lungs, or the digestive organs?

The regular use of these two simple diagnostic aids can do much to impress upon the animal owner the necessity for specific information regarding the several organs of the body. It will, at the same time, train the user to draw his diagnostic lines ever more sharply so that his treatments may be prescribed with greater accuracy and specificity.

But, most important of all, it will impress the client with the importance of diagnosis. It will also tend to reduce the reliance by the client on treatment which has been fostered and nurtured by many producers and purveyors of drugs and medicines.

The remedy which can be used most effectively to combat home treatment with drug store purchases is careful diagnosis. However, the remedy can only be effective when the client realizes that the examination being made is for the purpose of learning specific facts, and only after these facts are established can the proper treatment be selected.

The government of Great Britain has been petitioned to amend the laws in such a way as to prohibit the slaughter of horses fit for agricultural or other purposes.—*From the Veterinary Record.*

CURRENT LITERATURE

ABSTRACTS

Immunity to Infectious Bronchitis

In birds, the egg yolk appears to be the principal medium for the transference of passive immunity from the parent stock to the offspring. Using a quantitative neutralization test similar to that for Newcastle disease, it was found that chicks from artificially and from naturally immunized parent stock both showed antibodies at high level during the first two weeks with a decline by the fifth week. This early, rapid rise of antibodies following inoculation identifies the immunity as being passive in nature.—[*E. L. Jungherr and Naomi L. Terrell: Naturally Acquired Passive Immunity to Infectious Bronchitis in Chicks. Am. J. Vet. Res., 9, (April, 1948): 201-205.*]

The Brucella Abortus Ring Test

The test is performed by adding 1 drop of hematoxylin-stained Brucella antigen to 1 cc. of milk. Upon shaking thoroughly, the sample turns a bluish violet. It is incubated for one hour, when the action is usually complete. In negative milk, the cream layer is white, while the milk column is bluish violet. When the milk is strongly positive, the bluish violet is concentrated in the cream layer, the underlying column of milk being white.

The ring test is also called ABR (Abortus Bang Ring) test. It was developed in Denmark, where it has been used in more than 100,000 herds as a standard procedure in making brucellosis surveys. Since it works more reliably on pooled milk samples, such as may be collected from cans delivered at receiving centers, than it does on individual cow samples, the authors consider it "a quick, easy, reliable test for diagnosing brucellosis in herds."

By using the test routinely at relatively short intervals, newly infected herds can be located promptly. Then the veterinarian can draw blood samples from all members of the herd and remove the reactors. The present antigen makes the test much more sensitive than either the milk whey or blood agglutination test; in fact, the ring test will show a degree of reaction in a milk sample even when the blood sample of the same cow may show a reaction of only 1:10 or 1:20.

Results from use of the ring test are not in complete agreement with blood test results, but its use has simplified the survey procedure and has enabled Danish veterinarians to concentrate their efforts on the infected herds and to find the newly infected herds more promptly.—[*P. A. Bruhn: The Brucella Abortus Ring Test. Am. J. Vet. Res., 9, (October, 1948): 360-369.*]

[Dr. M. H. Roepke reported, recently, that the ring test and blood test had been compared on 7,022 Minnesota herds. The two tests agreed on 6,479 negative herds and 251 infected herds (95.8% of all herds). The blood test revealed reactors in 112 herds which had been negative on ring test, but in 41 (of 73 so checked) it was found that the reacting cow was not in production at the time of the test. The ring test showed positive reactions in 180 herds in which no animal showed a blood reaction at 1:50 or higher dilution.—THE EDITORS.]

Brucella Suis Infection in Cattle

Transmission of *Brucella suis* from infected swine to cattle does occur occasionally in nature, and can be accomplished experimentally. Acute bovine mastitis results from injection of *Br. suis* into the teat cistern. When established in the bovine udder, the infecting organisms are eliminated in the milk for comparatively long periods. The elimination may be constant or intermittent and, when present, they do constitute an important public health problem. Blood cultures were negative in these experimental animals, but the agglutination titer rose to 1:400 within ten days.—[*F. V. Washko, L. M. Hutchings, and C. R. Donham: Studies on the Pathogenicity of Brucella Suis for Cattle. I. Am. J. Vet. Res., 9, (October, 1948): 342-350.*]

Brucella Chemotherapy

Para-aminobenzoic acid (PABA) has been recognized as a growth factor for many bacteria and as a vitamin for plants and animals. There is also an antagonistic action between PABA and sulfanilamide. The presence of PABA inhibits the growth of a wide variety of organisms, but its effectiveness as a growth factor ceases in concentrations of more than 2 mg./100 cc. It has been used effectively in murine typhus in white mice and in rickettsial diseases. However, there is no inhibition of the growth of viruses, trypanosomes, spirochetes, malarial parasites, or *Entomoeba histolytica.*

The growth of *Brucella abortus, Br. suis,* and *Br. melitensis* on tryptose agar was completely inhibited by 2 mg./cc. of PABA, whereas

5 mg./cc. of its sodium salt was necessary to produce complete inhibition. Furthermore, suspensions of these three organisms in distilled water were killed in all concentrations of PABA from 3 to 20 mg./cc. within eighteen hours. The ultimate value of this drug in the treatment of brucellosis remains to be determined because in all blood cultures the death times were much lengthened over those found in distilled water and broth. Moreover, the sodium salt of PABA was much more effective than the acid itself in blood.—[*Cornelia M. Cotton and R. E. Swope: Brucella Chemotherapy. I. Studies of the Effect of Para-Aminobenzoic Acid on Brucella in Vitro. Am. J. Vet. Res., 9, (April, 1948): 164-168.*]

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When used on guinea pigs, there seems to be no doubt that the bactericidal action of the sodium salt of PABA was exerted on the organism. Lesions were entirely absent in the treated guinea pigs and, even when Brucella was isolated, not more than two to six colonies appeared on the plate in contrast to the heavy growth on the control plates. Guinea pigs heavily inoculated with a virulent bovine strain of *Brucella abortus* were treated with a sodium salt of para-aminobenzoic acid. A 5 per cent solution of the sodium salt, administered subcutaneously in 6-cc. amounts every four hours for twenty-one days, appeared to produce sterilization in 100 per cent of the animals when treatment was begun three days after the infective organisms were injected. When treatment was delayed for two weeks after infection, 80 per cent of the animals were negative to cultural examinations of spleen, liver, kidney, heart, lungs, and reproductive organs.—[*Cornelia M. Cotton and R. E. Swope: Brucella Chemotherapy. II. Para-Aminobenzoic Acid in the Treatment of Experimental Brucellosis in Guinea Pigs. Am. J. Vet. Res., 9, (April, 1948): 169-172.*]

Hemolytic Icterus in Foals

Hemolytic icterus in newborn foals has presented a problem to the horse breeder and veterinary practitioner for years. It is caused by certain blood factors and individual blood groups and is somewhat similar to, but distinct from, the Rh factor in man. Specifically, it occurs when the mare becomes sensitized to a certain type of erythrocytes carried by many stallions. When such a sensitized mare is bred to a stallion which transmits erythrocytes of this type (so that they are present in the fetus), the colt develops icterus within one or two days after birth, because the concentration of sensitizing antibodies is always high in colostrum.

The exact nature of the sensitizing process is not known, but it is possible that it takes place through the breakdown and absorption of parts of the fetal placenta. Once a mare becomes sensitized, it may produce an icteric foal when bred to a stallion with erythrocytes that are incompatible to the mare. A stallion, bred to 2 mares, is capable of siring both a normal and an icteric foal.

No practical tests have been devised to select first-offending mares, but establishment of blood types in horses would help to solve the problem. It is possible to test all mares against the stallions to which they are bred, but such tests made near the end of pregnancy would involve considerable time and expense.

Icteric foals are apparently normal when foaled, with red cell counts ranging up to 12,000,000 or higher per cubic millimeter. As soon as the foal suckles and absorbs the sensitizing antibodies present in the colostrum, there is a rapid destruction of erythrocytes, so that the count drops within a few hours to half, or less than half, of the normal. When the count falls below 3,000,000 per cubic millimeter, the life of the foal is in danger. The foal should be removed from its dam as soon as the condition is recognized, some 1,500 cc. of its antibody-laden blood removed and replaced with 2,000 cc. of compatible blood, and it should thereafter be placed on a nurse mare.

Hemolytic icterus may have even wider significance, since it may apply equally to baby pigs. The hog falls in the same category as the horse in transfer of passive immunity to the offspring, so that it is highly probable that certain types of baby pig anemia are caused by blood factors which operate in a similar manner.—[*D. W. Bruner, F. E. Hull, and E. R. Doll: The Relation of Blood Factors to Icterus in Foals. Am. J. Vet. Res., 9, (July, 1948): 237-242.*]

Tick Control and Eradication

One dipping in freshly prepared dips containing 0.5 per cent DDT or 0.25 per cent each of DDT and BHC resulted in rapid and complete elimination of all *Boöphilus annulatus* from infested cattle. For two weeks after dipping, the residual effect prevented reinfestation in constantly exposed animals.—[*N. G. Cobbett: DDT and DDT Combined with Benzene Hexachloride for the Control and Eradication of Boöphilus annulatus. Am. J. Vet. Res., 9, (July, 1948): 270-276.*]

Brucella Chemotherapy

Certain sulfonamides form a highly active bactericidal complex with the specific antibody-complement system. This complex will prevent the growth of, and kill, *Brucella abortus*, *Brucella suis*, and *Brucella melitensis in vitro* and *in vivo* in guinea pigs. The procedure described either counteracts the action

of inactive antibody molecules or possibly converts them into active ones.

Undiluted fresh serum or plasma from most normal and immune cattle contains specific antibodies which apparently are not present in the serum or plasma of brucella-infected cattle. These antibodies, in combination with complement, will kill Brucella organisms of all three types. The complement of the serum sample may be used direct, or fresh rabbit serum may be added for extra complement.—[*I. Forest Huddleson: The Potentiating Action of Sulfonamides on the Brucella Antibody-Complement System. Am. J. Vet. Res., 9, (July, 1948): 277-285.*]

Abortus Bang [Brucella Abortus] Ring Test

A comparison of the blood test and the milk test was done on 651 cows, using an improved antigen for the ring test. It was concluded that, by means of the ring test, it is possible to detect infected herds by examining pooled milk. This procedure, done at convenient intervals, may more easily accomplish the recognition of foci of infection than by annual blood tests.—[*P. A. Bruhn: Problems Associated with the Abortus Bang [Brucella Abortus] Ring Test. Skand. Vet.-tidskr., 38, (1948): 71-93.*]—A.G.K.

Mastitis in Norway

Not until accurate bacteriologic procedures, such as the Lancefield method of typing streptococci, became available was it possible to systematically control mastitis. Ten years ago, it was known that streptococci played some part in mastitis, but other factors such as cold and injury were considered of first importance. When bacteriologic supervision of dairy herds was instituted, the significance of streptococci became known. It is important that farmers be given information on the symptoms, etiology, prophylaxis, and treatment of mastitis. Herds must be carefully supervised by bacteriologic examinations of milk at short intervals. Hygienic measures must be stressed more than treatment. For a negative diagnosis, at least three specimens from each quarter must be examined because the shedding of streptococci may be intermittent. Infected cows must be separated from healthy animals and milked last. Systematic bacteriologic examination showed that the incubation period could be as long as two years but not less than twenty days. Single cases in a herd, which formerly would have been called sporadic, are really phases of an enzoötic of mastitis in the herd. The results of penicillin treatment are encouraging, but it is emphasized that prophylaxis is the important factor.

In 226 cows with a total of 513 infected quarters, two injections in twenty-four to forty-eight hours of 25,000 units of penicillin in 20 cc. of water was sufficient to render 63.7 per cent free of streptococci for one to fourteen months. Repeated treatments were required in the remainder. Penicillin treatment seemed to be most effective if given during the dry period.—[*O. Bratlie: Experiences in the Control of Mastitis in Norway. Skand. Vet.-tidskr., 38, (1948): 36-56.*]—A.G.K.

Vitamin E Treatment of "White Muscle" Disease in Lambs

This disease, which the authors call Zenker's muscle degeneration, occurs commonly in Sweden in lambs from 3 weeks to 2 months of age. A mortality of 40 to 50 per cent is not uncommon. Tests were made on the prophylactic and therapeutic effects of synthetic vitamin E. Some of the pregnant ewes on each of three farms were given 75 mg. of alpha-tocopherol acetate (ephynal vet. Roche) daily in the feed during gestation; the others served as untreated controls. The mortality among lambs from the three treated groups was 3.0, 47.5, and 3.45 per cent, respectively, as compared with 5.0, 94.3, and 16.25 per cent, respectively, for those from the untreated ewes. On farms where the lambs were given a prophylactic injection of 105 mg. of disodium alpha-tocopherol phosphate, there was no evidence of the disease. A therapeutic dose of 300 mg. per lamb prevented deaths and effected a cure. Chemical analyses of tissues from diseased lambs showed no significant differences in the alpha-tocopherol content as compared with normal animals. No histologic evidence of changes in the nervous system was obtained. It is recommended that ewes be given a diet containing wheat bran or wheat-germ oil and native hay. Newborn lambs should receive a subcutaneous injection of 100 mg. of di-sodium-alpha-tocopherol phosphate as a protective measure.—[*O. Swan and Anna-Lisa Obel: "White Muscle" Disease in Lambs and its Treatment with Synthetic Vitamin E. Skand. Vet.-tidskr., 38, (1948): 129-146.*]—A.G.K.

Sterility in Cows

According to examination and statistical data, approximately 20 per cent of the cows in Yugoslavia suffer from temporary or permanent sterility. The obstetric and gynecologic clinic of the veterinary faculty at Zagreb reports the location of the pathologic changes which were supposed to cause temporary or permanent sterility in cows, in the following percentage relationship: vagina 8.8 per cent, cervix 4.8 percent, uterus 53.0 per cent, fallopian tubes 3.0 per cent, and ovaries 22.8 per cent. A total of 3,505 sterile cows and heifers were observed.

Trichomonas infection was diagnosed by microscopic examination of the clinical material in 8.8 per cent of the cows being examined; however, according to clinical tests and an-

amnesis, a much greater percentage of cows suffer from sterility due to pathologic changes caused by this infection (10.0 to 15.0%).

Beneficial results can be achieved by appropriate treatment of sterile animals, but no considerable decrease in sterility can be expected by means of that alone. In order to achieve full success in the general improvement of breeding cattle, attention should be given to the elimination of harmful external causes which provoke sterility or cause pathologic lesions leading to sterility. The clinician must also pay utmost attention to the hygiene of parturition and coitus, and to the feeding, breeding, and exploitation of the animal.—[*B. Okljesa and V. Penavin: The Problem of Sterility in Cows. Jugosl. Vet. Glasnik, 1, (1948): 6.*]—E.F.

The Role of Dogs in the Epizoötiology of Hog Cholera

Material containing hog-cholera virus was administered to dogs by parenteral and oral routes, and their blood and urine were then given to susceptible pigs. Dogs which had received hog-cholera virus by injection or by ingestion did not react with increased temperature nor with any visible symptoms. The urine and blood were not pathogenic to pigs five, ten, and sixty-five days after the injection of virus. Dogs fed meat of swine infected with hog cholera, as well as dogs to which the virus was administered parenterally, did not excrete, in the urine, quantities of hog-cholera virus that could be biologically determined. The experiments lead to the conclusion that dogs play no rôle in the epizoötiology of hog cholera except as a mechanical transmitter of the virus.—[*B. Popovic: The Rôle of Dogs in the Epizoötiology of Hog Cholera. Jugosl. Vet. Glasnik, 1, (1948): 25.*]—E. F.

Alveolar Emphysema

It has been shown by other workers that, in horses, intravenous injection of histamine produces a syndrome resembling that of alveolar emphysema. It has also been shown that human patients with bronchial asthma are hypersensitive to histamine. It is probable that alveolar emphysema in horses and bronchial asthma in man may have something in common. It was, therefore, the purpose of this study to learn if horses with pulmonary emphysema are more sensitive to histamine than are normal horses. The effect of histamine upon the bronchial tone was examined by determining the intrathoracic pressure which was taken as a measure of the resistance to the flow of air in the lungs. Four to six liters of air were introduced in the pleural space and changes of pressure were measured on a tambour by means of a needle through the chest wall. Normally, the intrathoracic pressure is not raised above atmospheric pressure. In horses with alveolar emphysema, however, the pressure on expiration may exceed 100-300 mm. of water. There was even a negative pressure noted on inspiration.

In normal horses, histamine produces only transitory increases in the intrathoracic pressure, but in animals with alveolar emphysema, the drug causes marked increases in the positive and negative intrathoracic pressures. The respirations become violent in an attempt to overcome the resistance to the passage of air in the lungs. The effect was seen also when the vagus was cut or blocked, showing that the effect of histamine was direct. It persisted after the administration of atropine and could be elicited in clinically improved animals. Adrenaline reduced the increased intrathoracic pressure to normal. Alveolar emphysema in horses may possibly be a "histamine-susceptible" or "allergic" condition. Perhaps some species of mold on old hay may be the allergen which sensitizes horses.—[*Nils Obel, and Carl Schmiterlow: The Action of Histamine and Other Drugs on the Bronchial Tone in Horses Suffering from Alveolar Emphysema (heaves). Acta Pharmacol. et Toxicol., 4, (1948): 71-80.*]—A.G.K.

Glanders Medication

Both sulfanilamide and sulfathiazole were employed in the treatment of 3 clinical cases of glanders in mules and 1 artificially infected case in a donkey. Spectacular effects were observed upon the administration of the drugs, the action of which was quite alike. Fever was suppressed and dyspnea and nasal discharges were stopped during the course of medication, but as soon as the administration of the drugs was discontinued, symptoms of glanders reappeared, with exaggeration. Postmortem and cultural examinations, as well as animal inoculations, were all positive for glanders. It is concluded that the drugs used have no curative effect on glanders.—[*T. P. Hu: The Treatment of Glanders with Sulfonamides. J. of Anim. Husb. and Vet. Med., 6, (July, 1947): 27-30.*]—C.S.L.

Lapinized Rinderpest Virus

A total of 951 purebred dairy cattle, consisting of four breeds (Holstein-Friesian, Jersey, Ayrshire, and Shorthorn) were inoculated subcutaneously with the lapinized rinderpest virus, strain 111, in approximately 1 per cent spleen and lymph gland emulsion. In general, the cattle showed only a mild degree of reaction which was not observed with the naked eye. Among the breeds, Jerseys seemed to be most susceptible. About 150 cows were in advanced pregnancy and there was only a single case of abortion, the cause of which appeared to have no relation to vaccination. Temporary re-

duction of milk yield was an outstanding feature. Emaciated animals and 1- to 3-month-old calves showed more severe reactions. In several cases, there was a flare-up of chronic pneumonia. This caused the only death in the total of 951.—[*F. J. Kwong and C. T. Lee: Studies on the Lapinized Rinderpest Virus, Strain 111. 1. Susceptibility of Purebred Dairy Cattle. J. of Anim. Husb. and Vet. Med., 6, (July, 1947): 23-26.*]—C.S.L.

Acetonemia

During the period of high milk production, the demand for sugar is great. If the amount of sugar required cannot be supplied, fat must be utilized, resulting in an increase of acetone production. The principal source of sugar is from the fermentation of cellulose by the flora of the rumen. Optimum conditions for the growth of cellulose-fermenting microörganisms must be maintained. If there is an abrupt change in the diet from one poor in protein to one high in protein, the normal flora cannot quickly become adapted to the change. The formation of organic acids to maintain the proper pH of the rumen is retarded, as well as the synthesis of amino acids. Besides the decrease in sugar formation which results, there is an accumulation of protein decomposition products which may be absorbed and which damage and impair an already overtaxed liver. This series of events can be prevented by maintaining optimum growth conditions for the cellulose-fermenting microörganisms in the rumen. Instead of making an abrupt change to a high protein diet at parturition, it is recommended that small amounts of concentrates, together with carbohydrates and minerals, be added to the ration a month prior to parturition and gradually increased.—[*S. Hoflund and H. Hedstrom: Disturbances in Ruminal Digestion as Predisposing Factors in the Occurrence of Acetonemia. Skand. Vet.-tidskr., 38, (1948): 162-177.*]—A.G.K.

Coccidiosis Controlled by Fumigation

Methyl bromide was found to be effective in inactivating sporulated oöcysts of *Eimeria tenella* when properly applied at the rate of 0.15 to 0.3 cc./sq. ft., which is approximately 1 lb./1,000 sq. ft.—[*W. A. Boney, Jr.: The Efficacy of Methyl Bromide as a Fumigant for the prevention of Cecal Coccidiosis in Chickens. Am. J. Vet. Res., 9, (April, 1948): 210-214.*]

Enterotoxemia of Overeating Disease

A high degree of protection from ovine enterotoxemia was produced in feedlot lambs by injecting a single 5-cc. dose of a new *Clostridium perfringens* Type D bacterin. The immunized lambs were fed larger quantities of fattening feeds than are customarily fed, but losses from enterotoxemia were low; 3 of 1,967 immunized lambs (960 had 2 injections) as against 66 of 1,970 unvaccinated control lambs. The protection lasted for at least sixty-two days.—[*E. M. Baldwin, Jr., L. D. Frederick, and J. D. Ray: The Control of Ovine Enterotoxemia by the Use of Clostridium Perfringens Type D Bacterin. Am. J. Vet. Res., 9, (July, 1948): 296-303.*]

BOOKS AND REPORTS

Controlling Brucellosis

Brucellosis in dairy herds dropped from 20.64 per cent to 5.53 per cent when heifer calves were vaccinated between the ages of 4 and 8 months over a period of six years. The number of positive cattle in 1941 was 389. In 1947, it was only 96. During this same interval, 10 herds with production records showed an average increase of 52 lb. of butter fat per cow per year.

When the same type of vaccination was used in herds of beef cattle, the incidence of Brucella reactors dropped from 4.0 per cent to 0.9 per cent.

In all of these instances, no other precautionary measures were used in the control of the disease.—[*W. E. Maderious, Reuben Albaugh, and C. B. Outhier. Controlling Bang's Disease by Calf vaccination in Monterey County, Calif. Agricultural Extension Service, University of California, Berkeley. 11 pages. July, 1948.*]

America's Sheep Trails

This book tells the complete and colorful story of how the sheep industry of the American hemisphere developed. The author has drawn upon his long and extensive contact with the sheep industry and with sheep herders and breeders. His native gift as a story teller permits him to weave into the pages of this book not only the facts and historical incidents which everyone must know, but he has so interpreted these that the average reader will understand and enjoy reading the background and the steps which have led up to the present status of the sheep industry.

Beginning with the sheep of the Orient and of the early historical periods, the author has woven into the record here presented the gradual westward movement into the New World from the eastern seaboard, crossing the Alleghenies, through the Middlewest, and into the Far West. In so doing, he has given us an insight into the personalities of the men who were responsible for this westward expansion, as well as of the hardships which they were forced to overcome in order to maintain their flocks under the conditions which exist in the West, notably the presence of predatory ani-

mals, the adaptation to the types of foliage and herbage that is available in that area, and the seeking of a market for the animals which have been successfully raised to market age.

The book is much too voluminous and too good to attempt to tell the story within the limits of this review. However, we believe that no one who reads this book and has an interest in sheep will find upon completion that he has missed any important item which should have been told about the sheep industry of America.—[*America's Sheep Trails and Personalities. By E. N. Wentworth, Chicago, Ill. Cloth. 667 pages. Illustrated. The Iowa State College Press, Ames, Iowa. Price $7.00.*]

Sulfonamides in Veterinary Medicine

Following an opening chapter which discusses the solubility, the biochemistry, the blood concentrations, the range of effectiveness and methods of chemical determination of sulfonamides, the methods of administration and general recommendations for sulfonamide therapy, including dosage and toxicity, this booklet proceeds to list the local and systemic action of sulfanilamide, sulfathiazole, sulfadiazine, sulfapyridine, sulfaguanidine, sulfamerazine, and sulfamethazine. It publishes tables and figures indicating the rates of absorption and excretion, the blood levels achieved, and also discusses the therapeutic value of the several treatments. In addition, the booklet lists a bibliography of the veterinary uses of sulfonamides, which contains a total of 413 references.—[*G. H. Schneller, N. E. Foss, and C. F. Sullivan. Sulfonamides in Veterinary Medicine. Calco Technical Bulletin 723, Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J.*]

The Nation's Health—The Ewing Report

This report was prepared upon direct request from President Truman. It is based on the general hypothesis that health is everybody's business and that everybody should want and demand for himself and for those dependant on him the best of medical health and services. The report recognizes the fact that there is no such thing as free service. Health care, like everything else, has to be paid for by someone.

The report indicates that each year 325,000 human deaths occur, which we have the knowledge and skills to prevent. The program has been formulated because it is believed that the people who need health insurance most will not be able to get it under present voluntary plans. Although this report is based entirely upon a human health program, it provides interesting reading for veterinarians as an indication toward what may be anticipated in veterinary medicine if the present plan materializes in human medicine. The American Medical Association recently assessed each one of its members $25.00 to educate the public regarding provisions and implications of the Ewing plan.—[*The Nation's Health, a Ten-Year Program. By Oscar R. Ewing, Federal Security Administrator. Paper. 180 pages. September, 1948. U. S. Government Printing Office, Washington 25, D. C. Price $1.00.*]

Evolution of Aftosa

This is a series of 14 color charts showing the development of foot-and-mouth disease in the pig and the sheep, with one page of discussion for each species.—[*Proceso Evolutivo de la Fiebre Aftosa, Segunda parte. By A. A. Rottgardt and R. Ezcurra. Instituto Nacional de la Fiebre Aftosa, Chorroarin No. 168. Buenos Aires, Argentina. 1948.*]

Trivalent Aftosa Vaccine

A trivalent foot-and-mouth disease vaccine, Argentine O, A, and C types, has been developed by implanting the virus into the skin of a 3-month-old bovine fetus. That the virus has been cultivated is attested by the fact that it survived the initial isolation and four subsequent passages—a total of 480 hours of incubation at 37 C.—whereas control virus was destroyed at this temperature in thirty-six hours.

The report discusses the importance of tissue culture, a chronologic review of the development of this technique, the equipment used (including enrichment of medium), and experimental results.—[*Cultivo del Virus Aftosa Sobre Tejidos Fetales de Origen Bovino. By E. E. Palma Zuloaga. 40 pages. 30 figures. Paper. Instituto Nacional de la Fiebre Aftosa, Chorroarin No. 168. Buenos Aires, Argentina. 1947.*]

Hematology

In its 23 chapters, this book covers comprehensively the entire field of clinical hematology. Beginning with a classification of the anemias, it continues through a discussion of each type of anemia and the hematologic changes which characterize it.

The text, prepared on a broad basis to serve practitioners, is also in chronologic order so that the beginning student may follow the development of hematology. It also includes such detail that it will serve the needs of the advanced scholars in the field.

The accumulated information on this subject has been critically sifted and summarized. An alphabetic bibliography of 1,830 items, 14 pages of index, 72 figures, and nine color plates make this vast fund of information readily available and point the way for more efficient service in this rapidly growing field.—[*Hematology. By C. C. Sturgis. 915 pages. Cloth. Charles C. Thomas, 301 E. Lawrence Ave., Springfield, Ill. 1948. Price $8.50.*]

THE NEWS

AVMA 14th International Veterinary Congress Tour

The AVMA European tour planned for those who wish to visit other countries in connection with the 14th International Veterinary Congress in London from Aug. 8 to 13, 1949, is now definitely arranged as to places that will be visited and the time to be spent at each place. Complete information as to space on transatlantic boats is not yet available. This leaves the matter of price somewhat undetermined. The minimum cost of the tour by steamship (cabin class both ways) will be approximately $1,450. However, not all space in any class carries a minimum rate. The price depends, in part, on the location and the number of persons assigned to a stateroom. The round-trip rate of the tour (first-class) on "queen" steamers, or by plane, will range upward from the minimum approximately $250.

Plans of the steamships, showing the space available and the rate, will be mailed as early as possible to those making reservations, so that the choice of space may be indicated and also, whether the transatlantic crossing by air or surface craft is preferred. Full information concerning luggage, passports, mailing addresses, etc., will be mailed at an early date to those making reservations.

The maximum space available to the AVMA party includes accommodations for 70 persons. This is fewer than attended either the 1930 or the 1938 Congress, from this country, but it is all the space that could be procured even though application was made last June. Not all of it has been reserved as yet. Those planning to make the tour, but who have not made reservations, must do so immediately. All reservations must be accompanied by the required deposit of $450 per person. Applications for space on all Atlantic boats for next season far exceed the space available. Reservations may be cancelled up to thirty days before the sailing date with full refund of the deposit.

The schedule of countries, cities, and places that will be visited on the tour is essentially the same as that published earlier, but changes in dates have been necessary to obtain hotel reservations in some cities. The following is the revised itinerary. Not nearly all travel features which will be visited are given. Those listed are merely representative:

Revised Itinerary for Tour of Europe — 1949

July

15 Sail from New York on "S.S. Queen Elizabeth."

16-19 At sea.

20 Due to arrive Southampton. Continue by boat train to London.

21 Leave London by morning train for Harwich continuing by night steamer.

22 Arrive Esbjerg, Denmark, at 9:00 a.m. and continue by train to Copenhagen, arriving about 3:00 p.m.

23 In Copenhagen. City sight-seeing drive including the Old Town, the Charlottenborg Palace, Thorwaldsen Museum, Rosenborg Castle, Tivoli Gardens, and other places of interest. Visit the Royal Veterinary and Agricultural College and the State Serum Laboratory.

24 Train to Stockholm.

25 In Stockholm. Morning of sight-seeing in the city visiting the Royal Palace, Riddarholmen Island, the New Town Hall and other important places. Afternoon, visit the Royal Veterinary College and the State Veterinary Bacteriological Institute; motor trip to Drottningsholm, the "Swedish Versailles."

26 Train to Oslo.

27 In Oslo. Morning of sight-seeing, visiting Akershus Castle, Royal Palace, Open Air Museum with its Norse farmhouse and ancient viking ships.
Afternoon, visit State Veterinary Institute.

28 Overland tour of Norway fjords *via* Myrdal.

29 Flaam, Stalheim, and Voss.

30 Arrive Bergen about noon and sail B & V steamer about 2:00 p.m.

31 At sea.

August

1 Arrive Newcastle-upon-Tyne and continue by train to Edinburg.

2 In Edinburgh. Morning of sight-seeing, visiting the Royal Castle, St. Giles' Cathedral, John Knox House, the Royal Mile, Princes Street, Holyrood Palace, and Abbey.
Afternoon, visit the Royal (Dick) Veterinary College and Moredun Research Institute.

3 Full-day excursion by motor coach through the Trossachs, visiting Stirling, Bannockburn, Loch Lomond, Loch Katrine, etc.

4 Excusion by Abbotsford, Dryburgh Abbey, Melrose, Glamis Castle (Macbeth's home), etc.

5 Train to English Lake District.

6 Motor coach tour of the Lake District, visiting Windermere, Keswick, Grasmere, etc.

7 Morning train to London. Arrive before 5:00 p.m. (Certain social functions in evening.)

8 to 14 In London. Attend International Congress. (Transfers to and from Congress not included.)

15 Visit Ministry of Agriculture and Fisheries, Veterinary Research Laboratories at Weybridge, Smithfield Market, St. Paul's, London Tower, etc.
Leave London in the evening by train for

Harwich, continuing by night steamer to Holland.

16 Arrive at the Hook of Holland in the morning. Visit Schiedam abattoir, the newest and most up-to-date in Europe, and/or Rotterdam, thence to Amsterdam.

17 In Amsterdam—largest city in Holland. Visit the celebrated Ryks Museum, containing many Rembrandt paintings, the Royal Palace, diamond cutters, and other places of interest. Also, half-day excursion to quaint Volendam and the Isle of Marken.

18 Train to Brussels.

19 In Brussels—the "Little Paris," capital of Belgium. Motor tour of the city, visiting the Grande Place, Hotel de Ville, Palace of Justice, Cathedral, and the unique Wiertz Museum. Visit l'École de Médecine Vétérinaire de l'État.

20 Train to Basel.

21 Morning train to Lucerne.

22 to 23 In Lucerne—"queen of Swiss resorts." Excursion by lake steamer and mountain railway to the summit of the Rigi.

24 Motor coach to Interlaken *via* the Furka and Grimsel passes and the Rhone Glacier.

25 In Interlaken, at the foot of the mighty Jungfrau. Excursion by mountain railway to Scheideck, *via* Lauterbrunnen and Wengern, returning by way of Grindelwald.

26 Morning train to Berne. Half-day sightseeing in this remarkably preserved medieval city, including the veterinary college.

27 Train to Paris.

28 to 31 In Paris. One day of sight-seeing in the city, visiting the Louvre, Notre Dame Cathedral, Napoleon's Tomb, the Tomb of the Unknown Soldier, and the principal boulevards and buildings. On another day, motor to Versailles, visiting the Palace and gardens, also the Chateau of Malmaison, and a half-day visit to l'École National Vétérinaire d'Alfort.
One evening trip to night clubs.
Two free days for shopping.

September

1 Preparing for return journey, etc.

2 Fly Pan-American Airways.

3 Arrive New York.

To repeat: (1) Some space is yet available on this tour. (2) The price ranges from approximately $1,450 to $1,700, depending upon the ocean transportation (surface or air) and the price of the stateroom. (3) The space is mainly cabin class but a limited number of first-class reservations are available. The "queen" steamers are the finest boats afloat and cabin class on them is superior to what first-class was on any boat only a few years ago. (4) The price of the tour includes transportation from New York and back to New York; all scheduled sight-seeing trips; hotels and meals, except lunch and dinner during the Congress; gratuities, except tips on the boats; conveyance of baggage; and admissions to museums or other places where a charge is made. (5) The hotels which will be patronized in Europe are classed as "O1" and are comparable to the La Salle Hotel or the Sherman Hotel in Chicago. (6) Those making the eastward transatlantic passage by air will leave New York on July 19 and join the main party in London. (7) September sailings are not definitely set at this writing, but those returning by boat will probably leave Cherbourg September 2 or Southampton September 3, and arrive in New York six days later.

Reservations, accompanied by a deposit of $450, should be sent to Dr. D. M. Campbell, 7632 S. Crandon Ave., Chicago 49, Ill.

14th International Veterinary Congress

(Continued from the January JOURNAL, *p. 43)*

Membership.—In the United States, applications for membership in the Congress should be submitted to the United States Committee. The committee expects to have available for distribution in the near future application forms for use in this country. They will be supplied to secretaries of state associations, veterinary colleges, veterinary science departments, state livestock sanitary officials, and other interested agencies for as wide circulation as possible so that a large number of membership subscriptions can be obtained. Usually, a considerable number of veterinarians do subscribe, even though they do not expect to attend the Congress, in order to obtain a copy of the published proceedings which contain a full report and also the papers presented. Applications will also be obtainable from the AVMA office, 600 S. Michigan Ave., Chicago 5, Ill.

Subscriptions (Membership Fees).—The Organizing Committee in London has announced the following schedule of membership subscriptions.

Ordinary members: £4 Sterling (approx. $16.00), which includes Congress badge, entertainments (except Congress dinner for which a charge will be made), and one copy of the full report of the Congress.

Student members: £1.10s. Sterling (approx. $6.00), which includes Congress badge and the right to attend meetings, but not the right to speak, vote, or to receive a copy of the Congress report. Student members may, however, purchase the report separately at a price to be announced later.

Associate members (wives and families of members): £1 Sterling (approx. $4.00), which includes Congress badge, the right to attend special functions arranged for them, and the use of special accommodations for social purposes.

The British Government has issued invitations to foreign, commonwealth, and colonial governments to send official delegations to the Congress. Invitations have also been sent to government veterinary departments, and to universities, veterinary schools, and other interested bodies in every country.

It is hoped that there will be a large representation from the United States, not only of those attending the Congress in London, but also of veterinarians who will subscribe for membership in order to obtain a copy of the Congress proceedings for future reference.

Special attention is invited to the revised

itinerary of the AVMA European tour to the Congress, which also appears in this issue.

Hotel Accommodations.—For those who expect to attend the Congress but are not making the tour, it is absolutely essential that they make hotel reservations for themselves without delay. Hotel accommodations in London are reported as "extremely overloaded" and it will be impossible to obtain rooms at the last minute.

Thomas Cook and Son have been appointed by the London committee as travel and accommodation agents. Persons not taking the AVMA tour should make early hotel reservations through the aforementioned agency which has offices in all principal cities.

The approximate hotel rates in London are:

High-grade room only (without bath)—
$5.00-$7.50 per day per person.

First-class room only (without bath)—
$4.00-$6.00 per day per person.

Second-class room only (without bath)—
$3.50-$5.50 per day per person.

Proposal for Nonveterinary Disease Tests Held Up

The Honorable Charles F. Brannan, Secretary of Agriculture, served notice in the *Federal Register*, Dec. 31, 1948, title 48—11538, of a plan to amend the "regulation for prevention of tuberculosis, paratuberculosis, and Bang's disease of cattle." Under the amended regulation, indemnities would be paid to owners of cattle destroyed on account of these diseases upon the basis of tests conducted by nonveterinary technicians.

Dr. W. R. Krill, chairman of the Executive Board, immediately filed a letter objecting to the provisions of the amendment and requesting time for preparation and presentation of formal statements by leaders in the field of livestock disease prevention and control and by veterinary organizations.

Objections were also filed by several state veterinary associations and by a number of state livestock sanitary officials. As a result of the prompt action by the AVMA and other interested agencies, official approval of the proposed amended regulation has been withheld.

AVMA Rabies Exhibit at National Farm Show

Over 100,000 people attended the second annual National Farm Show in Chicago Nov. 27 to Dec. 4, 1948, where a colorful AVMA exhibit on rabies was among the educational attractions.

Karakul sheep, goats, rabbits, honey bees, chinchillas, and commercial exhibits were also part of the show which surpassed that of the previous year both in quality and attendance.

The AVMA was invited to exhibit at the show along with other leading scientific and educational organizations. Participation in events of this type is a new phase of the Association's expanded public relations program. As now organized, the AVMA program draws constant public attention to all branches of veterinary service, with special emphasis on the practitioner's contributions to the nation's welfare. It reaches into every community of the United States, as well as into many parts of Canada, through the coöperation of about 500 radio stations and several thousand newspapers and farm publications.

Detroit Program Developments

Progress toward the development of a program for the annual convention, July 11-14, is rapid. The program committee consists of the chairman and secretary of each of the six sections, with the executive secretary as chairman. Dr. Hardenbergh has asked Dr. R. C. Klussendorf, assistant executive secretary, to serve in his place as chairman. Representing the several sections are: General Practice, Drs. E. A. Erickson and A. G. Madden; Public Health, Drs. L. W. Rowles and Alexander Zeissig; Research, Drs. O. W. Schalm and C. C. Morrill; Small Animals, Drs. S. R. Elko and Harry B. Roberts; Poultry, Drs. W. R. Hinshaw and C. H. Cunningham; and Surgery and Obstetrics, Drs. C. Harvey Smith and E. A. Woelffer. These officers have outlined the subjects they would like to have discussed, and are sending out speaking invitations. Offers of papers and of suggestions for papers are invited from members interested in providing the best program possible.

Because the meeting will be held a month earlier than usual, and because the Executive Board is considering the advisability of issuing a Convention Proceedings book, all speakers will be requested to file complete papers by March 1.

Present program plans, while still tentative, call for a general session on either Monday or Tuesday evening in order that the convention may adjourn at noon on Thursday, July 14. The program committee expects to have definite information about some of the speakers and their topics in time for the March JOURNAL.

AVMA Research Fellows

D. A. Schmidt was born Jan. 29, 1922. He was educated at the University of Wisconsin (B. S. 1944) and at Michigan State College (D. V. M. 1947), and transferred directly from college to his AVMA fellowship at the Mayo Foundation, Rochester, Minn.*

SUMMARY OF WORK TO DATE

Dr. Schmidt's interest centers on the encephalitis that is seen incident to, or following, canine distemper. His early work was an attempt to produce encephalitis by intracranial inoculation of distemper virus in dogs. As the work progressed, and serial passages of the virus were made, it was found that many of the changes seen on examination of the stained sections could not be accurately interpreted, because little was known of the types of postmortem changes in the brain. This seemingly minor point has therefore assumed major importance, and the immediate

*This is the sixth of a series which was started in July 1948 (*see* JOURNAL, July, 1948:87).

problem is to determine what postmortem changes take place, and the rapidity of such changes at varying temperatures. This is a very fundamental study, because the changes produced by disease can be accurately determined only when the possible postmortem changes have been recognized.

Dr. Donald A. Schmidt

Brains are removed from dogs within a few minutes after death. While one half is incubated at 37 C. the other half is refrigerated at 4 C. At varying intervals, portions of the brain are fixed, sectioned, stained, and studied.

Concurrently, a feeding trial has verified reports of others that heavily agenized flour will produce convulsions in dogs. Three different methods of vaccinating dogs for distemper are also being studied, and the results will be reported.

STUDENT CHAPTER ACTIVITIES

Iowa Chapter.—At the January 19 meeting of the Iowa State College Student Chapter of the AVMA, Mr. Arthur Anderson, Department of Animal Husbandry, spoke on "Swine Management and Production in Iowa."

s/ROLAND C. BUNGE, *Secretary.*

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Kansas Chapter. — The Borden Award for high scholarship was presented to John P. Hughes at a meeting on Oct. 5, 1948. The award is based purely on grades earned during the first three years of the veterinary curriculum.

WOMEN'S AUXILIARY

California Auxiliary. — At the mid-winter conference of the California State Veterinary Medical Association on Jan. 10-12, 1949, at San Luis Obispo, the Women's Auxiliary held a business meeting and were entertained at a tea, bridge party, and the banquet.

s/MRS. E. V. EDMONDS, *Secretary.*

Indiana Auxiliary.—National Auxiliary President Mrs. A. E. Bott, Belleville, Ill., and National Auxiliary Secretary-Treasurer Mrs. C. L. Miller, River Forest, Ill., addressed the Women's Auxiliary to the Indiana Veterinary Medical Association at the meeting of the State Association on Jan. 13-15, 1949. Members also enjoyed a chalk talk act, a talk on charm, musical program, and a fashion show.

s/MRS. H. W. DEMSEY, *President.*

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Nebraska Auxiliary. — Members of the Women's Auxiliary to the Nebraska Veterinary Medical Association were entertained at bridge, a luncheon, and the annual banquet at the fifty-second annual meeting of the State Association on Jan. 7-9, 1949.

s/MRS. H. GROSS, *Secretary.*

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Wisconsin Auxiliary.—At the annual meeting of the Wisconsin Veterinary Medical Association at the Park Hotel in Madison on Jan. 6-7, 1949, the Women's Auxiliary was entertained at a bridge luncheon, theater party, shopping tour, and enjoyed the banquet with their husbands.

s/MRS. S. K. ANDREASSEN.

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Mrs. Ayers, Third Vice-President. — No organization is worthy of the time and interest of busy women unless there are worthwhile projects to give purpose and aim to its members.

The Women's Auxiliary to the AVMA was started with a great aim and purpose, the student loan fund, which has been our main objective. This project has been outlined and explained (*see* Jan., 1949, JOURNAL, p. 45). To enlarge our scope, one member of the executive board is selected each year to promote new ideas and find new projects for the consideration of the entire auxiliary. This duty falls to our third vice-president, Mrs. H. W. Ayers, 7 N.E. 9th St., Oklahoma City 4, Okla.

Mrs. H. W. Ayers

Mrs. Ayers has been active for many years in the Oklahoma State Auxiliary, having served as both secretary and president. She is also active in professional and civic organizations in her community and is well qualified to be an efficient and interested mem-

ber of the Auxiliary board. She is making a special study of projects that will enlarge our purpose and increase the need for an active Auxiliary to the AVMA.

s/(MRS. A. E.) ETHLYN BOTT, *President*.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BARRETTE, JEAN-MARIE
Dept. of Agric., Bathurst, N.B., Canada.
D.V.M., École Médecine Vétérinaire, Quebec, 1948.
Vouchers: J. D. Nadeau and J. Dufresne.

BRIGGS, WALTER S.
286 Sycamore St., East Aurora, N. Y.
D.V.M., New York State Veterinary College, 1936.
Vouchers: L. J. Tillou and H. V. Baker.

CRANSTON, RAYMOND E.
2436 S. Hilyard, Eugene, Ore.
D.V.M., State College of Washington, 1945.
Vouchers: F. Gunster and G. H. Keown.

DAYTON, ROLAND C.
R. D. No. 2, Allison Park, Pa.
V.M.D., University of Pennsylvania, 1920.
Vouchers: H. B. Prothero and J. G. Hardenbergh.

DIMON, CHARLES E.
1181 Calada St., Los Angeles 23, Calif.
D.V.M., Kansas State College, 1932.
Vouchers: G. H. Murphy and M. P. Polak.

HEVIA, GERARDO
Pezuela No. 46, Cojimar, Havana, Cuba.
D.V.M., University of Havana, 1943.
Vouchers: M. Herrada and M. Stincer.

KIELDSEN, ROBERT F.
412 E. Morgan, Chesterton, Ind.
D.V.M., Michigan State College, 1940.
Vouchers: O. W. Seher and L. J. Cook.

NOETHE, EDWARD M.
Slayton, Minn.
D.V.M., Iowa State College, 1931.
Vouchers: C. P. Schmidt and R. A. Thompson.

STIEBER, SAM
18 K River View Gardens, North Arlington, N. J.
D.V.M., New York State Veterinary College, 1937.
Vouchers: S. S. Nebb and F. L. Bartlett.

TORO, EDUARDO E.
P. O. Box 3487, Santurce, P.R.
D.V.M., Texas A. & M. College, 1944.
Vouchers: E. R. Toro, Jr., and C. Clavell.

VARDAMAN, THOMAS H.
P.O. Drawer 952, Auburn, Ala.
D.V.M., Alabama Polytechnic Institute, 1948.
Vouchers: A. H. Groth and A. B. Larsen.

Second Listing

Marion, Louis W., 2125 W. 10th Ave., Gary, Ind.

Alabama Polytechnic Institute

Douglas, Thomas J., D.V.M., Box 992, Greenville, S. Car.

Watson, B. Lamar, D.V.M., 1074 S. Florida Ave., Lakeland, Fla.

Texas A. & M. College

Baker, Owen D., D.V.M., Drew Veterinary Clinic, Rt. 4, Monticello, Ark.

Switzer, William P., D.V.M., 1104 7th St., Dodge City, Kan.

University of Chile

Goic, Roberto J., M.V., Casilla 9294, Santiago, Chile.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U. S. BAI are reported as of Dec. 21, 1948, by Chief B. T. Simms.

TRANSFERS

Parker F. Carr, from Jersey City, N. J., to New York, N. Y.

William L. Flanagan, from Jersey City, N. J., to New York, N. Y.

Roland J. Gibbs, from Fort Dodge, Iowa, to Waterloo, Iowa.

Curtis I. Harkins, from Richmond, Va., to Louisville, Ky.

Robert M. Hollen, from Mexico City, Mexico, to Des Moines, Iowa.

Raymond R. Houser, from San Francisco, Calif., to Los Angeles, Calif.

Martin Kagan, from Boston, Mass., to Clayton, N. Y. (not at Thousand Island Park, N. Y., as previously listed).

John J. Martin, from Jersey City, N. J., to Washington, D. C.

John F. Moore, from Topeka, Kan., to Mexico City, Mexico.

Richard B. Myers, from Atlanta, Ga., to Oklahoma City, Okla.

RESIGNED

Grover J. Behrens, Indianapolis, Ind.
Martin A. Bree, Newark, N. J.
Howard S. Boggs, Columbus, Ohio.
Frederick L. Buente, Indianapolis, Ind.
Philip D. Fichandler, Mexico City, Mexico.
Rollin L. Gant, Indianapolis, Ind.
Walter J. Gibbons, Auburn, Ala.
Walter B. Gross, Mexico City, Mexico.
Robert H. Gump, Wichita, Kan.
Earl D. Hubbard, Des Moines, Iowa.
Robert C. Jacobs, St. Paul, Minn.
Tony C. Willo, Jr., Mexico City, Mexico.

RETIRED

Robert H. MacDonald, Baltimore, Md.
Walter L. G. Geick, Waterloo, Iowa.
William C. Dye, El Paso, Texas.

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New Examination for Veterinarians.—The Civil Service Commission has announced a new examination for veterinarians in various federal agencies in Washington, D. C., and throughout the United States. A majority of the vacancies to be filled are in the Bureau of Animal Industry in the Department of Agriculture and begin at $3,727 annually.

Applicants must have a degree from an accredited college or university and either a year of professional work, a year of college work in preveterinary medicine, or a year of

graduate study in veterinary medicine. Students who expect to complete the required courses within six months of the date of filing application may apply.

Application forms may be obtained from second-class post offices or from the Commission's central office in Washington, D. C. Applications will be accepted until further notice.

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Retires After Thirty Years with BAI.—Mr. D. S. Burch, who for thirty years wrote and/or edited most of the official releases and many of the formal reports issued by the USDA

Dallas S. Burch

through the BAI, retired from the Department effective Dec. 31, 1948. Among the Bureau's well-known livestock campaigns for which Mr. Burch handled releases and reports were the better-sires campaign, the eradication of bovine tuberculosis, cattle fever ticks, brucellosis, and a few outbreaks of foot-and-mouth disease. He has also aided in the National Poultry Improvement Plan.

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Dr. Foss Reëlected President of NAFV.—Dr. W. D. Foss, Prairie du Chien, Wis., was reelected president of the National Association of Federal Veterinarians at the annual meeting in Denver, Colo., Oct. 13, 1948. Also reëlected was Dr. A. A. Husman, Raleigh, N. Car., vice-president-at-large. Dr. E. C. Cannon, Topeka, Kan., was elected secretary-treasurer to fill the vacancy left by the resignation of Dr. C. H. Fauks.

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Extension Specialists Needed.—Nineteen of the states have one or more positions for veterinarians as extension specialists. The USDA Extension Service Report for November, 1948, by C. D. Lowe, listed six vacancies in these positions.

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USDA Tells Livestock Research Plans.—Among research projects now under way or to be started this year by USDA agencies are studies of the nutritive values of hay, new feeds from animal and vegetable waste products, addition of amino acids to feeds, wheat poisoning in ruminants, sheep parasites, baby pig losses, and toxicity of the newer insecticides for livestock.

AMONG THE STATES AND PROVINCES

Alabama

Personal.—Dr. Bill Dorrough (API '34) was elected mayor of the city of Leeds on Oct. 20, 1948. He will continue his general practice along with his new duties as mayor.

California

Southern Association.—The monthly meeting of the Southern California Veterinary Medical Association was held at the Clark Hotel, Los Angeles, on Dec. 15, 1948. Speaker of the evening was Dr. Marshall Urist (M.D.), who spoke on "Methods of Treatment of Human Fractures and Their Application for Veterinary Use."

The Southern California Veterinary Medical Association has been incorporated under the laws of California as a nonprofit organization.

s/C. E. WICKTOR, *Resident Secretary.*

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State Association.—The California State Veterinary Medical Association held its annual mid-winter conference at the Anderson Hotel, San Luis Obispo, on Jan. 10-12, 1949. Members of the University of California staff who participated in the program were:

DR. GEORGE H. HART, dean, Department of Veterinary Science, Davis: "Coördination of Veterinary Services in California" and "Sex Hormones as Therapeutic Agents."

DR. THEODOR K. BRUNNER, The George William Hooper Foundation, San Francisco: "Leptospirosis."

DR. HUGH S. CAMERON, Department of Veterinary Science, Davis: "Certain Practitioner Problems in California."

DR. DONALD E. JASPER, Department of Veterinary Science, Davis: "Acetonemia."

DR. M. HOBMAIER, The George William Hooper Foundation, San Francisco: "Nematode Parasites Common to Man and Domestic Animals."

MR. S. A. PEOPLES, Department of Comparative Pharmacology, Davis: "Antibiotics in Veterinary Medicine."

Other speakers on the program were:

MR. JOSEPH B. SWIM, toxicologist, San Francisco: "Blunders in Medico-Legal Testimony."

DR. E. M. BALDWIN, the Corn States Serum Company, Omaha, Neb.: "The Control of Ovine Enterotoxemia by Biological Products" and "Infectious Keratitis of Cattle."

DR. MYRON THOM, Pasadena: "Recent Advances in Radium and X-Ray Therapy."

DR. C. P. ZEPP, SR., president-elect, AVMA: "The Diagnosis and Treatment of Diseases of the Ear in Dogs and Cats, Including Surgery," "Obstinate Skin Diseases," and "AVMA Affairs."

DR. MYRON THOM was moderator of a panel discussion, "Business Methods in Small Animal Hospitals." Others participating in the discussion were Drs. JOSEPH M. ARBURUA, San Francisco; LEO F. CONTI, San Diego; GLEN H. KENASTON, San Bernardino; and REX TAYLOR, San José.

DR. E. M. DOBBS, Los Angeles County Livestock Department, Pico: "Problems Met in Farm Bureau Mastitis Control Project in Los Angeles County."

DR. P. D. De LAY, Division of Animal Industry, State Department of Agriculture: "Dust and Air-Borne Studies of Q Fever."

DR. B. E. ELSON, Division of Animal Industry, State Department of Agriculture: "Some Aspects of Q Fever in Los Angeles County."

DR. CHARLES D. STAFFORD was moderator of a panel discussion, "Bovine Sterility." Other members were Drs. ROBERT A. BALL, Modesto; WALTER I. DILL, San Fernando; S. A. FULLER, Ferndale; and ARCHIE R. INMAN, Visalia.

DR. W. A. YOUNG, treasurer, AVMA, and managing director of The Anti-Cruelty Society, Chicago, Ill.: "Practical Humane Work."

DR. W. A. McDONALD, in charge, USDA, Sacramento: "Coöperative Progress in the Veterinary Profession."

s/CHARLES S. TRAVERS, *Secretary.*

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Position Open for Dairy Inspector.—The California State Personnel Board announces an examination for dairy inspector to be given at Sacramento, San Francisco, Los Angeles, and such other places in California as the numbers of candidates warrants. The examination date is March 3, 1949, but applications must be filed by Feb. 10. The salary range is $255-$310. Applicants must be U.S. citizens and residents of California for at least one year prior to date of examination. Further details may be obtained from the State Personnel Board, Sacramento, Calif., or from local employment offices.

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Personal.—Dr. George H. Hart (UP '03), dean of the School of Veterinary Medicine, University of California, is the author of an article "Science Paves the Way—for Progress," in the *Western Livestock Journal*, Dec., 1948.

Delaware

State Association.—The Delaware Veterinary Medical Association held its annual meeting at Wolf Hall, University of Delaware, Newark, on Dec. 16, 1948. Dr. J. C. Shaw, University of Maryland, spoke on "Acetonemia," and Dr. C. C. Palmer, University of Delaware, discussed "Studies on the Control of Mastitis in Delaware."

Officers elected were Drs. C. C. Palmer, Newark, *president;* E. L. Symington, Newark, *secretary-treasurer;* G. G. Rosenberger, Wilmington, M. L. Zurkow, Dover, and L. J. Manogue, Seaford, *executive board.*

It was decided to hold bi-monthly meetings during 1949.

s/E. L. SYMINGTON, *Secretary.*

Florida

Veterinarians File Protest.—Veterinarians of Pensacola, in December, 1948, filed a protest to a statement, credited to the city council, that inoculation of dogs was "merely a racket by veterinarians." The statement was allegedly made during the debate by the council on the dog ordinance to eliminate the provision of compulsory inoculation of dogs for rabies.—*Pensacola Journal, Dec. 17, 1948.*

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Racing Officials Tighten Precautions.—Track executives across the nation, it seems, are determined to eliminate illegal practices in Thoroughbred racing.

"Mugging" is one of the principal weapons being used against the possibility of horses being doped and painted. At New York courses and at Hialeah Park in Florida, the mugging system, which provides for detailed photographic identification of horses entered in competition, along with individual records of their measurements, their special markings, and other pertinent data, has been adopted. In addition, the animals are given a thorough physical examination before going to the post, and winners are examined for evidence of doping after each race.

Tattooing of an identification number under the upper lip is another safeguard in popular use.

—*Acme Photo*

Dr. Jay N. Thomas giving "Cherry Jam" the fever test at Hialeah Park. Officials of the track have inaugurated a system of testing race horses for physical fitness and possible doping. Records are kept of temperature, pulse, and respiration before and after the race.

Insistence on such precautions by a few leading tracks has inspired state racing associations and lesser tracks around the circuit to follow suit. Their efforts are being supported by veterinarians and research laboratories devoted to the development of better tests for doping and simpler methods of foolproof identification.

Illinois

Chicago Association.—The regular meeting of the Chicago Veterinary Medical Association was held Dec. 14, 1948, at the Anti-Cruelty Society. Mr. Lyman Peck, nutrition expert, spoke on "Veterinarians as I See Them."

The ladies held their annual Christmas party at this meeting.

s/ROBERT C. GLOVER, *Secretary.*

Indiana

State Association.—The sixty-fifth annual convention of the Indiana State Veterinary Medical Association was held at the Severin Hotel, Indianapolis, Jan. 13-15, 1949. The scientific program follows:

DR. J. W. CUNKELMAN, Ft. Dodge, Iowa:

"Bovine Sterility" and "Mastitis in Cattle."

DR. JAMES H. STEELE, chief, Communicable Disease Center, U. S. Public Health Service, Washington, D. C.: "The Veterinary Practitioner and Community Health."

DR. O. NORLING-CHRISTENSEN, Wilmette, Ill.: "Report from District AVMA Executive Board Member."

DR. H. C. H. KERNKAMP, St. Paul, Minn.: "Diseases and Disorders of Suckling Pigs" and "Noninfectious Diseases of the Post-Weaning Period."

DR. PETER T. ENGARD, Marysville, Ohio: "Parasitism of Sheep."

DR. C. D. BARRETT, Akron, Ohio: "Practical Treatments of Small Animals."

LIEUT. COL. W. W. YOUNG, Fort Harrison: "The Rôle of the Veterinarian in Today's Army."

DR. W. G. MAGRANE, Mishawaka: "Diagnosis and Treatment of Diseases of the Eye."

DR. G. W. GILLIE, Fort Wayne: "Foot-and-Mouth Disease."

DR. L. M. HURT, president of the AVMA: "Message from the President of the AVMA."

DR. H. E. MOSES, Purdue University, Lafayette: "Important Poultry Disease Problems in Indiana."

DR. L. C. KIGIN, Terre Haute: "Business Side of Practice."

MR. DAMON CATRON, Department of Animal Husbandry, Iowa State College, Ames: "Recent Developments in Swine Nutrition."

DR. C. F. HUFFMAN (Ph.D.), Dairy Department, Michigan State College, East Lansing: "Bovine Nutrition."

DR. J. F. BULLARD, Purdue University, Lafayette, was moderator of a panel on "Practical Methods of Restraint and Anesthesia as Applied in Practice." Other members of the panel were DRS. FRANK BOOTH, Elkhart; C. HARVEY SMITH, Crown Point; S. E. BOWMAN, Odon; and GEORGE R. BURCH, Zionsville.

The motion picture "Cataract Surgery in the Dog" was shown.

s/WADE W. GARVERICK, *Secretary.*

Iowa

Personal. — Dr. Sterling Barber (COLO '43) and Mr. George Dunn, Mason City, have purchased the Rockwell, Iowa, *Tribune.* Dr. Barber is president of the North Iowa Trotting Horse Association and a member of the North Iowa VMA and the AVMA.—*The Exeter Nebraska News, Nov. 23, 1948.*

Kentucky

Conference for Veterinarians.—The twenty-second annual conference for veterinarians was held at the University of Kentucky on Dec. 8, 1948. The scientific program follows.

DR. ROSS BROWN, Department of Animal Pathology: "Laboratory Diagnosis."

DR. D. M. SEATH, Dairy Department: "Artificial Insemination in Kentucky."

MR. HARRY F. WALTHERS, state commissioner of agriculture: "Brucellosis Control."

DR. D. W. BRUNER, Department of Animal Pathology: "Jaundiced Foals."

DR. W. L. HANAWALT, Owenton: "Practical Mastitis Control."

DR. N. A. POTT, Glasgow: "Problems Encountered in Large Animal Practice."

DR. GEORGE R. BIRCH, Pitman-Moore Co.: "Recent Developments in Veterinary Therapy."

The ladies auxiliary of the KVMA enjoyed the banquet with their husbands.

s/ROSS BROWN, *Secretary.*

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Personal.—Dr. A. N. Sheppard (COLO '44) is associated with Dr. C. L. Smith (KCVC '13) at Elizabethtown, Ky.

Maryland

State Association.—The Maryland State Veterinary Medical Association met at the Hotel Emerson, Baltimore, on Dec. 9-10, 1948. The scientific program follows.

DR. JAMES V. McCAHAN, Downingtown, Pa.: "Cattle Practice."

DR. A. N. ARMSTRONG, Baltimore: "Pitfalls in Small Animal Surgery."

DR. F. S. WHARTON, Centerville: "Tuberculin Testing."

DR. JOHN GADD, Towson: "Small Animal Surgery."

DR. A. L. BRUECKNER, director, Livestock Sanitary Service, Baltimore: "Maryland Livestock Sanitary Service and the Practitioner."

DR. MILTON P. SAUSE, Baltimore: Encephalitis in the Dog."

The motion pictures "Johne's Disease" and "Swine Brucellosis" from the AVMA film library were shown.

Approximately 75 veterinarians attended this meeting.

s/J. WALTER HASTINGS, SR., *Secretary.*

Massachusetts

State Association. — The regular monthly meeting of the Massachusetts State Veterinary Association was held Dec. 15, 1948, at the Hotel Statler, Boston. Dr. Norris B. Flanagan (M.D.) spoke on mental disorders in human and veterinary medicine, and Mr. Stanley N. Gaunt, extension professor, Department of Dairy Industry, University of Massachusetts, spoke on "The Mastitis Control Program in Massachusetts."

s/C. LAWRENCE BLAKELY, *Secretary.*

Mississippi

State Association.—The forty-third annual meeting of the Mississippi State Veterinary Medical Association was held at the Pinehurst Hotel at Laurel on Jan. 20-21, 1949. The program follows.

DR. JOE F. KNAPPENBERGER, Ashe Lockhart Laboratories, Kansas City, Mo.: "Discussion of General Cattle Diseases" and "Bovine Problems of Interest to the General Practitioner."

DR. R. C. KLUSSENDORF, assistant executive secretary of the AVMA: "Mastitis and the Practitioner," "Brucellosis Eradication," and "The AVMA and its Problems."

DR. LOUIS LEONPACKER, LaFayette, La.: "Veterinary Education in the South."

DR. T. A. SIGLER, Greencastle, Ind.: "Equine Diseases and Operations."

DR. W. M. COFFEE, LaCenter, Ky.: "Anesthesia and Restraint of Large Animals" and "Uses of Whole Blood and Their Technique."

DR. H. T. CARTRITE, Shreveport, La.: "Toxic Eclampsia."

s/S. A. COX, *Secretary.*

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A Veterinary Officer's Impressions of Animals at War.—Dr. Andy W. Crawford (KSC '30), of Rolling Fork, Miss., who served as a lieutenant colonel in the Veterinary Corps during World War II, has written an unusual war story. The manuscript, 122 typewritten pages, tells in the words of one veterinarian what hundreds of his colleagues in uniform must have seen and felt as they traveled to far-flung places to carry out their duties in food inspection and animal care.

Dr. Crawford has made no arrangements, as yet, for publishing his story, entitled "Animals at War." It describes the shipment of mules and other live cargo to overseas stations. Relating how the animals were cared for and how their soldier-attendants felt about them, the story is interwoven with some of the amusing episodes that relieved the monotony and tension of transport duty. In the author's introductory words, "this is a story of one phase of total warfare, where men and animals worked together and did a job well."

Missouri

Kansas City Association.—The regular meeting of the Kansas City Veterinary Medical Association was held Dec. 21, 1948, at the Hotel Continental. Guest speaker was Dr. E. W. Millenbruck, Carthage, who discussed a new type of general anesthetic for horses which he and Dr. Wallinga developed and perfected while serving with the Army Veterinary Hospital, Fort Riley, Kan.

s/EARL L. MUNDELL, *Secretary.*

Nebraska

State Association.—The fifty-second annual meeting of the Nebraska State Veterinary Medical Association was held Dec. 7-9, 1949, in the Hotel Cornhusker, Lincoln. After the president's address, the scientific program was presented.

DR. I. FOREST HUDDLESON, brucellosis laboratory, "Veterinary Obstetrics."

DR. I. FOREST HUDDLESON, brucellosis laboratory, Department of Bacteriology and Public Health, Michigan State College, East Lansing: "Brucellosis."

DR. CLYDE F. CAIRY, School of Veterinary Medicine, Michigan State College, East Lansing: "Why Endocrine Treatments Sometimes Fail."

DR. E. M. BALDWIN, veterinary bacteriologist, Corn States Serum Co., Omaha: "Ovine Enterotoxemia and Its Control."

DR. RUE JENSEN, Division of Veterinary Medicine, Colorado A. & M. College, Fort Collins: "X Disease in Cattle."

DR. J. E. PETERMAN, in charge, state BAI, Lincoln: "Swine Erysipelas."

DR. O. H. PERSON, Wahoo: "Report on Conference on Brucellosis."

DR. CARL OLSON, JR., Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln: "Newcastle Disease."

DR. R. C. KLUSSENDORF, assistant executive secretary, AVMA, Chicago: "Raising Dairy Calves" and "Activities of the AVMA."

DR. J. N. McILNAY, Omaha: "Methods of Diagnosis of Leptospirosis in Dogs."

DR. A. H. QUIN, head, professional service division, Jensen-Salsbery Laboratories, Kansas City, Mo., conducted a swine forum. Others participating in the forum were DRS. CLARK COLLINS, West Point; E. W. PACK, Auburn; W. J. PRICE, Wisner; L. E. HANSON, Lincoln; and L. E. WILLEY, Sioux City, Iowa.

Officers elected at this meeting were Drs. L. I. Hines, Spencer, *president;* Norman Kruse, Genoa, *vice-president;* L. V. Skidmore, Lincoln, *secretary-treasurer;* S. B. Stafford, North Platte, and Clark Collins, West Point, *directors;* Paul L. Mathews, Omaha, was reëlected *resident secretary* of the AVMA.

s/L. V. SKIDMORE, *Secretary.*

New York

Conference for Veterinarians.—The forty-first annual conference for veterinarians of the New York State Veterinary College, Cornell University, Ithaca, was held at the College on Jan. 5-7, 1949. The following program was presented:

DR. S. A. ASDELL (Ph.D.), College of Agriculture, Cornell University: "Hormone Control of the Estrous Cycle in Dairy Cattle."

DR. JOHN McLEOD (M.D.), Cornell University Medical School: "The Physiology of the Male Reproductive System with Special Reference to Spermatozoa."

MR. K. C. BEESON, director, U. S. Plant, Soil, and Nutrition Laboratory, Ithaca: "The Occurrence of Trace Element Deficiencies in Soils of the U. S. with Special Reference to Cobalt in New York."

DR. S. E. SMITH (Ph.D.), College of Agriculture, Cornell University: "Cobalt Deficiency Studies with Sheep."

DR. FRANK J. COTE, director, the Small Animal Clinic, Ontario Veterinary College, Guelph, Canada: "Case Reports from the Small Animal Clinic of the Ontario Veterinary College."

DR. L. W. GOODMAN, president, New York Veterinary Medical Society, Manhasset: "Floor Plans and Hospital Management."

DR. MARK ALLAM, School of Veterinary Medicine, University of Pennsylvania, Philadelphia: "Surgical Diseases of the Canine Vagina."

DR. J. D. SWEET, Chateaugay: "The Use of Antihistaminics in Veterinary Practice."

DR. L. R. BARNES, USDA, BAI, Albany: "Federal Disease Control Programs with Reference to New York."

DR. W. E. SWALES, veterinary parasitologist, Department of Agriculture (Canada), Macdonald College, P.Q.: "The Veterinarian as a Parasitologist."

DR. L. L. BARNES, College of Arts and Sciences, Cornell University: "Isotopes Used in Biology and Medicine."

The following speakers are from the staff of the New York State Veterinary College:

DRS. F. H. FOX and S. J. ROBERTS: "Current Problems and Newer Treatments."

DR. K. I. GUMAER: "Pseudomonas Infections of Cows' Udders."

DR. P. P. LEVINE: "Brazilian Experiences."

MISS PHYLLIS LARSEN: "The Use of the Opsonic Index in Studies on Bovine Brucellosis."

DR. S. J. ROBERTS: "A Comparison of Anesthetics for Epidural Use."

DR. R. W. DOUGHERTY: "Some Practical Points on the Physiology of the Rumen."

DR. J. L. McAULIFF: "Some Diseases of Calfhood."

DR. W. E. JENNINGS: "What Problems Will Confront the Veterinary Service of the U. S. Army in the Event of Another War?"

DR. J. H. WHITLOCK: "The Relationship of Nutrition to the Development of Trichostrongyloidosis in Sheep."

The following films were shown: "Cases from the Ambulatory Clinic," "Reproduction Among Mammals," "Perineal Herniorrhaphy," "Gelfoam," and "Bovine Mastitis."

s/W. A. HAGAN, *President.*

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New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held at the Hotel Pennsylvania on Jan. 14, 1949. Speakers on the program were Drs. Frank Beach (Ph.D.), Department of Psychology, Yale University, New Haven, Conn.: "Psychophysiology and Patterns of Behavior in Small Animals" (with illustrations); and Brenden J. Baldwin, field director, National Dog Record Bureau: "The Identacode System."

Drs. Norman Linde and Carl L. Schenholm have been guests at two meetings.

Officers elected at the Dec. 1, 1948, meeting are Drs. Sol Shapera, *president;* J. Stuart Crawford, *president-elect;* C. R. Schroeder, *secretary-treasurer;* I. E. Altman, Charles Fletcher, and R. S. MacKellar, Jr., *executive committee;* and J. J. Merenda, F. O. Wright, L. R. Barto, C. E. DeCamp, H. E. Grossman, J. Lebish, E. A. Rogoff, and J. A. Ward, *committee on ethics.*

s/C. R. SCHROEDER, *Secretary.*

North Carolina

Personal.—Dr. J. Sibley Dorton (KCVC '18), Shelby, N. Car., president of North Carolina State Fair which was held in Raleigh in October, was host to President Harry S. Truman on Oct. 19, 1948. President Truman spoke on the opening program of the fair and at the unveiling of a monument honoring the three presidents born in North Carolina.

Ontario

New Style of Branding Reactors.—Veterinary Director General Childs has issued instructions to all veterinarians under date of Dec. 17, 1948, that henceforth cattle reacting to the serologic test for brucellosis shall be branded with a B on the right cheek and those reacting to the tuberculin test with a T on the left cheek, the order to take effect Jan. 3, 1949. Inspectors are warned to watch for the brucellosis tattoo and T-punched ears previously used for marking reactors. The new ruling cancels previous orders on the use of such markings.

Pennsylvania

Conference for Veterinarians. — The forty-ninth annual conference of veterinarians of the University of Pennsylvania was held at the School of Veterinary Medicine, Philadelphia, on Jan. 4-5, 1949. After the address of welcome by Dean Raymond A. Kelser, the scientific program was presented.

DR. W. T. FITTS, JR. (M.D.), associate in surgery, University of Pennsylvania Medical School: "The Effects of Intramedullary Pinning on Bone Healing; Experimental Study in Dogs."

DR. H. A. MILO, chief, tuberculosis division, BAI, Harrisburg: "Progress in Bovine Tuberculosis Eradication in Pennsylvania."

DR. L. M. HURT, president of the AVMA: "The American Veterinary Medical Association."

DR. JOSEPH W. BEARD (M.D.), professor of surgery, Duke University, Durham, N. Car.: "Electron Micrography of Purified Viruses."

DR. JAMES C. MUNCH (Ph.D.), Munch Research Laboratory, Temple University, Philadelphia: "Toxicology of Pesticides."

DR. M. S. SHAHAN, in charge, foot-and-mouth disease research, BAI, Washington, D. C.: "Foot-and-Mouth Disease Vaccine and the Vaccination Program in Mexico."

DR. C. P. HEGARTY, director of antibiotic research at Sharp & Dohme Laboratories, Philadelphia: "The Development and Uses of Antibiotics."

DR. EDMOND J. FARRIS (Ph.D.), executive director of Wistar Institute: "Treatment of Sterility in the Human Being with Special Reference to Artificial Insemination."

DR. K. L. TURK (Ph.D.), professor of animal husbandry, Cornell University, Ithaca, N. Y.: "What's New in Dairy Cattle Nutrition?"

DR. A. B. CRAWFORD, in charge, animal disease station of Pathology Division, USDA: "Pertinent Facts About Brucellosis of Cattle in Relation to Practical Control Measures."

DRS. P. H. SEITZ, Wrightsville; ARTHUR D. GOLDHAFT, Vineland, N. J.; E. L. STUBBS, University of Pennsylvania, School of Veterinary Medicine; A. L. BRUECKNER, director, Maryland State Sanitary Service, Baltimore; and F. R. BEAUDETTE, poultry pathologist, Rutgers University, participated in a panel discussion of Newcastle disease (avian pneumoencephalitis).

Speakers from the staff of the University of Pennsylvania, School of Veterinary Medicine, were:

DR. WALTER E. LaGRANGE: "The Relation of Protein Metabolism to Parturient Paresis."

DR. JACQUES JENNY: "Kuentscher's Method of Intramedullary Pinning in Canine Fractures."

DRS. H. M. MARTIN and JOHN W. MILLS: "Canine Infectious Hepatitis."

DR. JOSEPHINE M. DEUBLER: "Feline Enteritis."

The ladies enjoyed the informal conference dinner with their husbands.

s/JOHN D. BECK, *Chairman.*

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Keystone Association.—The Keystone Veterinary Medical Association met at the University of Pennsylvania, School of Veterinary Medicine, on Dec. 22, 1948. Dr. L. L. North, Pennsylvania BAI, spoke on "Recent Investigations of the Sales of Horse Meat for Small Animal Food."

s/RAYMOND C. SNYDER, *Secretary.*

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Personal.—Dr. Leonard Mirsky has been named consultant veterinarian of the new veterinary division of the Amburgo Co., Inc., Philadelphia.

Texas

New Agricultural Research Station. — The Texas Agricultural Experiment Station has acquired the Bluebonnet Ordnance Plant from the War Assets Administration Department and is now developing it into an agricultural research station. The area covers approximately 17,500 acres, much of which is excellent farmland. On Sept. 1, 1948, the experimental breeding work with sheep and goats was transferred to the new station, now called the Bluebonnet Farm. In addition, a breeding project with beef cattle is also being initiated.

s/BRUCE L. WARWICK (*In charge of experimental work with livestock*).

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Personal.—Dr. James K. Northway (KCVC '17), chief veterinarian for the King Ranch, Kingsville, and professor of Animal Husbandry at the Texas College of Arts and Industry, was recently reëlected county commissioner. Dr. Northway was featured in an article in the *San Antonio Express*, Nov. 7, 1948.

Washington

Personal.—Dr. Alastair Greig of Edinburgh, Scotland, who joined the University of Illinois, College of Veterinary Medicine, staff as visiting assistant early in 1948, is now at the State College of Washington, College of Veterinary Medicine, on a temporary basis. Dr. Grieg is a member of the National Veterinary Medical Association of Great Britain and Ireland, and of the Highland and Agricultural Society of Scotland.

s/R. E. NICHOLS, *Dean,*

Wisconsin

State Association.—The thirty-fourth annual meeting of the Wisconsin Veterinary Medical Association was held at the Park Hotel, Madison, on Jan. 6-7, 1949. After the business meeting, the scientific program was presented.

DR. G. R. SPENCER: "Mastitis Testing." DRS. GEORGE GETTELMAN, Hartford, and GEORGE LANG, Barron, led a discussion on this paper.

DR. D. T. BERMAN: "The Ring Testing of Milk for Brucellosis." DRS. W. R. WINNER, Madison, and CLYDE D. LYLE, Waukesha, led the discussion on this paper.

DR. S. H. McNUTT: "Brucella Research Program (Progress Report)." DRS. C. R. CURTIS, Portage, and J. T. SCHWAB, Madison, led the discussion.

DR. W. WISNICKY, Fond du Lac: "Brucellosis Disease Control." DRS. C. A. BRANDLY, Madison, and ARLYE McDERMID, Middleton, discussed this paper.

DR. JESSE SAMPSON, University of Illinois, College of Veterinary Medicine, Urbana, Ill.: "Swine Diseases." DRS. O. C. SELBY, Mankato, Minn., and R. B. HIPPENBECKER, Fennimore, led the discussion on this subject.

DRS. W. R. WINNER, inspector in charge, USDA, and J. T. SCHWAB, director of livestock sanitation, Madison: "Report on Livestock Sanitation."

DR. C. R. CURTIS, Portage: "Report of WVMA Delegate."

DR. O. NORLING-CHRISTENSEN, Wilmette, Ill.: "AVMA Activities."

DR. T. H. FERGUSON, Lake Geneva, presided over an open discussion of case reports.

DR. B. B. MORGAN presented an illustrated travelogue.

Drs. Berman, Brandly, McNutt, Morgan, and Spencer are from the Department of Veterinary Science, University of Wisconsin, Madison.

s/B. A. BEACH, *Secretary.*

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North Central Association.—The North Central Wisconsin Veterinary Medical Association held its winter meeting at the Hotel Freeman in Black River Falls on Dec. 8, 1948. The following program was presented:

DR. D. T. BERMAN, Madison: "Ring Test for Brucellosis."

DR. B. A. BEACH, Madison: "Newer Cattle Diseases."

DR. J. T. SCHWAB, Oconomowoc: "Wisconsin Brucellosis."

DR. BEN J. SCHLIMOVITZ was host at the banquet.

s/J. E. McDERMID, *Secretary.*

FOREIGN

England

"Low" Form of Avian Pneumoencephalitis.—What is described as a "low form of Newcastle disease" (avian pneumoencephalitis), often symptomless and detectable only on blood testing, is giving British veterinarians a problem to ponder (*Vet. J.*, Sept., 1948).

The low-grade infection was not recognized until recently, incident to the testing of chickens in laying trials. There was no indication that these birds had been in contact with diseased stock during the contests. Instead, a check of the home premises showed that the infection was present there. Reacting birds were found also in hatcheries. In one hatchery, indications were that the low form may have existed for as long as three years. The acute form, now being dealt with in Britain primarily by slaughter and disinfection, is identical with the form that exists in several European countries. The low-grade form, in contrast, is unlike the European disease and only slightly similar to that existing in North America. It is not as virulent as the American form and does not affect egg production.

Kenya

Rinderpest Conference at Nairobi.—Rinderpest and its control was the subject of a meeting sponsored by the Food and Agricultural Organization of the United Nations at Kenya. From Oct. 28 to Nov. 1, 1948, the gathering discussed the vaccines available (goat, rabbit, tissue, and chicken embryo), and the methods of immunizing with them. It was concluded that the chicken embryo vaccine was superior to other types. [Readers will recall that development of this project was highly secret work conducted by the Joint United States-Canadian Commission and the Chemical Warfare Service, U. S. Army, which was first reported in the *American Journal of Veterinary Research*, vol. 7, (April, 1946): part II.]

The official report says, "It is the considered opinion of this meeting that, with the prophylactics now available being effective and cheap to produce, the eradication of rinderpest is a practical possibility and should be carried out without further delay." Other conclusions dealt with field control, maintenance of reserve of vaccines, and general problems in rinderpest-infested areas.

Poland

Veterinary Meeting in Warsaw.—The Food and Agricultural Organization of the United Nations sponsored an animal disease meeting Nov. 11 to 21, 1948, in Warsaw. Ten European countries sent 25 delegates, and there were 30 Polish observers. Countries represented were Czechoslovakia, Great Britain, Norway, Poland, Hungary, Austria, Bulgaria, Holland, Italy, and Sweden.

FAO experts attending were Drs. K. V. L. Kesteven, M. M. Kaplan, and R. T. Allman. Swine erysipelas, foot-and-mouth disease, tuberculosis, dourine, hog cholera, Newcastle disease, brucellosis, Teschen disease, mastitis, and nutritional diseases were discussed.

All papers were distributed in English, with abstracts in French and Polish. Many films and other demonstrational materials were used during the meeting, and field trips were taken to the National Polish Veterinary Laboratories at Pulawy and the state stud farm at Walowice.

VETERINARY MILITARY SERVICE

Veterinary Corps Plans Discussed by General McCallam.—Present activities of the Army Veterinary Corps and plans for future operations are discussed by Brig. Gen. J. A. McCallam in the *Army-Navy Journal* (Oct. 16, 1948).

Need has arisen for revamping the Veterinary Corps plan of operations, and General

McCallam cites the following responsible factors:

1) Virtual elimination of horses and mules from the present military organization.

2) Growing importance of veterinary service with military governments, as an agency for rehabilitating animal industry in war-ravaged nations.

3) Food inspection problems created by the newer types of warfare, including atomic warfare as it may affect food supplies and animal health.

4) Constant developments in formulating, packaging, and shipping troop rations—calling for adjustments in the techniques of veterinary inspection.

5) New emphasis on research in animal diseases as they relate to the health of troops and tactical operations, rather than bearing directly on animal health.

Current planning does not discount the possibility that future emergencies may again necessitate the use of large numbers of animals, either by American troops or their allies. For this reason, Veterinary Corps personnel will continue to receive training along this line, although principal emphasis will be on food inspection.

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V. C. Reserves Called to Active Duty.—Veterinarians holding a Reserve commission who have not served 90 days on active duty, exclusive of periods of training, are subject to extended active duty call any time prior to their twenty-sixth birthday. This authority is granted under the Selective Service Act of 1948 and the administrative regulations promulgated to implement the Act.

Officials of the Veterinary Division of the Surgeon General's Office report that the critical shortage of Veterinary Corps officers has made it necessary to use these provisions to acquire additional officers. Orders calling ten veterinary officers for extended active duty have already been requested.

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Inventory to be made of Reserve Officers.—An army-wide inventory is to be made of all reserve officers to facilitate: (1) assignment of specific type duties for which each officer is best qualified to meet mobilization requirements; (2) establishment of military occupational specialties commensurate with military and civilian experience and education; (3) immediate utilization of man-power (skills) in a war or other national emergency through machine records of accounting ; (4) classification and screening of personnel prior to an emergency to avoid loss of time and man-power in mass mobilization.

Changes in qualifications, such as additional education, new occupational experience, or recent avocations are necessary to keep records up to date. Instructions will be furnished with questionnaire.

s/JOHN C. KEELE, JR.,
Major, U. S. Army.

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Major Jones Receives Appointment.—George Washington University has announced the appointment of Major Thomas C. Jones, V.C. (WASH '35), to the graduate council of that university as a Master in Research in comparative pathology. Major Jones is on duty in the Army Institute of Pathology, formerly having been director of the Veterinary Research Laboratory at Fort Robinson, Neb. He is known for his research work with equine periodic ophthalmia and equine influenza.

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Major Maurer Receives Degree.—Major Fred D. Maurer, V.C. (WASH '37), has received the doctorate degree from the graduate school of Cornell University. He graduated from the University of Idaho with a Bachelor of Science degree in 1934, and then entered Washington State College, obtaining his degree in veterinary medicine in 1937. Major Maurer is presently assigned to the Veterinary Division, Medical Department Research and Graduate School, Army Medical Center, Washington, D. C.

BIRTHS

To Dr. (KSC '43) and Mrs. Robert P. Worthman, Pullman, Wash., a daughter, Janet Claire, on July 5, 1948.

To Dr. (KSC '47) and Mrs. A. R. McLaughlin, Kansas City, Mo., on Aug. 7, 1948, a son.

To Dr. (KSC '42) and Mrs. Jack Cady, Arlington, Neb., a son, Thomas Dale, on Aug. 16, 1948.

To Dr. (KSC '41) and Mrs. Warren J. Dedrick, El Cajon, Calif., a son on Aug. 20, 1948.

To Dr. (KSC '44) and Mrs. R. C. Reed, Hillsboro, N. Dak., a son on Aug. 25, 1948.

DEATHS

John H. Allingham (ONT '07), Willard, Ohio, died June 8, 1948.

★**H. Wood Ayers** (ONT '08), 61, Oklahoma City, Okla., died Nov. 21, 19 8. of a protracted cardiovascular disturbance. His devotion to the practice of veterinary medicine was shown, while he was engrossed in some problem, by his seeming dismissal of an inclination to rest or eat until some solution was found. He was well known as a surgeon and as a breeder of dogs and rabbits. Dr. Ayers was admitted to the AVMA in 1917.

James J. Bogan (CORN '23), Oneida, N. Y., died Oct. 21, 1948. Dr. Bogan had served with the Bureau of Animal Industry of the New York State Department of Agriculture.

Thomas A. Bray (KCVC '92), 91, El Paso, Texas, died Nov. 23, 1948, of a lingering illness. Dr. Bray was one of the three members of the first graduating class of the Kansas City Veterinary College. The others were Drs. Thomas A. Donald, Lincoln, Ill., and the late William Bell, Nashville, Tenn.

J. V. Chamberlin, McClure, Ohio, died on Sept. 4, 1948.

William S. O'Bryan (TH '12), Pesotum, Ill., died on June 3, 1948.

A. W. Cleaves (MC G '98,) 76, Hancock, Maine, died on Nov. 18, 1948, after a long illness.

★**W. A. Evans,** M.D., onetime commissioner of health for Chicago, whose name has been

listed among the honorary members of the AVMA for thirty-four years, died at his home near Aberdeen, Miss., Nov. 8, 1948, where he had lived in retirement for more than twenty years. In the medical profession, he is remembered for founding the first diagnostic and research laboratory for physicians, for his activities as a health official, and for being the first health editor for a metropolitan newspaper—the *Chicago Tribune*. His election to honorary membership in 1915 was due to his tireless participation in livestock sanitary work.

In the history of veterinary medicine, Dr. Evans' name is remembered for his work in bovine tuberculosis control long before the livestock farmers were aware of its economic importance. Dr. Evans made veterinary-medical coöperation an issue in public health work.

John Fredenberg (KSC '21), Duncan, Okla., died on Oct. 11, 1948, of shock and complications following severe burns.

Philip L. Gauntt, Sr. (ONT), 74, Mt. Holly, N. J., died Dec. 5, 1948. A member of the New Jersey State Veterinary Medical Association, Dr. Gauntt had practiced in Mt. Holly for forty years.

★**Lt. Col. Charles S. Greer** (ISC '26), 47, Tulsa, Okla., died on Dec. 7, 1948. Lt. Col Greer was also a graduate of the Army Veterinary School and the Medical Field Service School. His last duty station was Pomona Quartermaster Depot, from which he was retired in the grade of lieutenant colonel on Jan. 31, 1945, because of physical disability. Lt. Col. Greer was a past president of the Tulsa VMA, a member of the Executive Board of the Oklahoma VMA, and a member of the AVMA since 1929.

Adolph C. Hexamer (AMER '88), Stamford, Conn., died Oct. 12, 1948.

★**Stephen G. C. Kelly** (IND '06), 64, Elwood, Ind., died on Nov. 2, 1948, of a heart attack. Dr. Kelly was a member of the Indiana State Veterinary Medical Association and of the AVMA.

★**Otto A. Kinneberg** (OSU '19), 59, St. Paul, Minn., died Oct. 28, 1948. Dr. Kinneberg was a member of the AVMA.

★**Ernest C. McCulloch** (KSC '24), 49, Pullman, Wash., died at his home Dec. 1, 1948. Although he had been in poor health for some time, Dr. McCulloch was able to continue his work as professor of bacteriology at Washington State College, College of Veterinary Medicine, until November 23. He is noted for his research in disinfectants, and his book "Disinfection and Sterilization" has been adopted as a text and reference book. Dr. McCulloch was admitted to the AVMA in 1926.

John McKay, Sr. (ONT. '95), Duluth, Minn., died Nov. 3, 1948.

★**Claude F. McKinney** (TH '09), 63, Arthur, Ill., died on Nov. 11, 1948. Dr. McKinney was a member of the Illinois Veterinary Medical Association and of the AVMA.

John W. Marshall, Genoa, Ohio, died Aug. 15, 1948.

Charles M. Morgan (ISC '02), Postville, Iowa, died in September, 1948.

★**Alexander A. Mortimer** (UP '21), 52, Randolph, Vt., died of coronary thrombosis on Dec. 12, 1948. He was stricken while attending a sick cow, and died a few hours later. Dr. Mortimer had practiced in Randolph for twenty-five years and was a member of the AVMA for more than twenty years.

★**John J. Naughton** (ONT '13), 56, Scranton, Pa., died Dec. 6, 1948. He was in charge of dairy hygiene for the Dairymen's Coöperative Association in Pennsylvania, New York, and New Jersey. Dr. Naughton was a member of the Pennsylvania Veterinary Medical Association, the North East Pennsylvania Veterinary Society, the U. S. Public Health Association, and the AVMA.

★**Clinton Linn Pease** (UP '42), 32, Eighty-Four, Pa., died Dec. 11, 1948, following a long illness. After serving as a captain in the Veterinary Corps during World War II, Dr. Pease started general practice in Eighty-Four. He was admitted to the AVMA in 1942.

★**John D. Reardon** (MC K '09), 63, Peoria, Ill., popular and widely known veterinarian of the Middlewest commercial circles, was killed instantly in an automobile accident on Dec. 20, 1948. He was a pioneer in the development of the hog-cholera antiserum industry on the basis of reliable products and the "graduate only" plan of application, obviously applying the knowledge gained in the scientific handling of rinderpest under Stanton Youngberg in the Philippine Islands where he served after his graduation. Dr. Reardon is survived by his widow and two foster children. He joined the AVMA in 1910.

Howard Casper Reed (KSC '15), Kansas City, Kan., died of a heart attack on Nov. 22, 1948. Dr. Reed had been a junior veterinarian in the meat inspection service of the U. S. BAI.

★**Carr Y. Reeder** (TH '17), 67, Elorado, Ill., died on Oct. 28, 1948, after a long illness. Dr. Reeder was a member of the Illinois Veterinary Medical Association and of the AVMA.

★**George F. Root** (WASH '18), 54, Seattle, Wash., died of a heart attack on Feb. 21, 1948. Dr. Root was a member of the Seattle and Washington State veterinary medical associations and of the AVMA.

★**William M. Simpson** (MC G '90), 85, Malden, Mass., died Jan. 2, 1949. Dr. Simpson was a member of the Massachusetts Veterinary Association for forty-six years and had been admitted to the AVMA in 1908.

★**W. F. Straker** (IND '15), 64, Greenville, Ohio, died on July 12, 1948. Dr. Straker was a member of the AVMA for twenty-eight years.

★**John L. Tyler** (CVC '91), 78, Whittier, Calif., died Dec. 24, 1948. An obituary editorial will appear in the March JOURNAL.

Francis J. Verduin (MC K '06), South Bend, Ind., died on Nov. 23, 1948. Dr. Verduin had been employed by the U.S. BAI until his retirement in 1939.

H. H. Webster (KCVC '10), Milton, Ill., died on Nov. 3, 1948.

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COMING MEETINGS

Kansas State Veterinary Medical Association. Annual meeting. Wichita, Kan., Feb. 2-4, 1949. C. W. Bower, 3119 Stafford St., Topeka, Kan., secretary.

New Jersey State Veterinary Medical Association. Annual meeting. Hotel Hildebrecht, Trenton, N. J., Feb. 3-4, 1949. J. R. Porteus, p.o. box 938, Trenton, N. J., secretary.

Louisiana State Veterinary Medical Association. Annual meeting. Louisiana State University, Baton Rouge, Feb. 8-9, 1949. C. M. Heflin, Baton Rouge, La., secretary.

Arkansas State Veterinary Medical Association. Annual meeting. Little Rock, Ark., Feb. 17-18, 1949. T. D. Hendrickson, Route 5, Box 422A, Little Rock, Ark., secretary.

Colorado A. & M. College, Division of Veterinary Medicine. Conference for veterinarians. Colorado A. & M. College, Fort Collins, Colo., Feb. 21-23, 1949. James Farquharson, Colorado A. & M. College, Division of Veterinary Medicine, Fort Collins, Colo., head, Department of Surgery and Clinics.

Alabama State Veterinary Medical Association. Annual meeting. Lyons Hotel, Decatur, Ala., Feb. 24-25, 1949. I. S. McAdory, 301 E. Magnolia, Box 410, Auburn, Ala., secretary.

(*Continued on page 22*)

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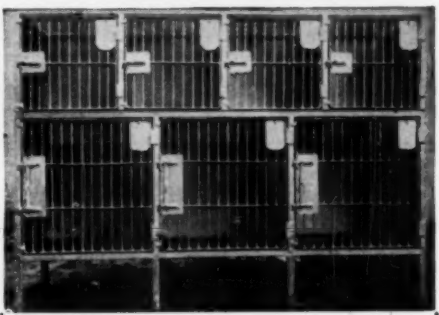

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(Continued from page 20)

Louisiana, Southwest Veterinary Medical Association. Thibodaux, La., Feb. 24, 1949. L. H. Pease, Southwest Louisiana Industrial Institute, Lafayette, La., acting secretary.

Southeast Missouri Veterinary Medical Association. Spring meeting. Farmington, Mo., April 13, 1949. F. A. Stepp, 405 North St., Sikeston, Mo., secretary.

Iowa, North Central Veterinary Medical Association. Spring meeting. Wahkonsa Hotel, Fort Dodge, Iowa, April 21, 1949. B. J. Gray, Fort Dodge, Iowa, secretary.

American Animal Hospital Association. Annual meeting. Edgewater Beach Hotel, Chicago, Ill., May 5-7, 1949. Wayne H. Riser, Box 872, Evanston, Ill., secretary.

Alabama Polytechnic Institute. Annual conference for veterinarians. Alabama Polytechnic Institute, Auburn, Ala., June 7-9, 1949. Dr. J. E. Greene, Cary Hall, A.P.I., Auburn, Ala., chairman.

Texas Veterinary Conference, A. & M. College of Texas. Annual conference. School of Veterinary Medicine, College Station, June 9-10, 1949. R. D. Turk, A. & M. College of Texas, College Station, Texas, chairman.

Georgia State Veterinary Medical Association. Annual meeting. Atlanta Biltmore Hotel, Atlanta, Ga., June 13-14, 1949. Chas. C. Rife, 420 Edgewood Ave., N.E., Atlanta, Ga., secretary.

New York State Veterinary Medical Society. Annual meeting. Pennsylvania Hotel, New York City, June 23-25, 1949. J. S. Halat, 1231 Gray Ave., Utica, N. Y., secretary.

North Carolina Veterinary Medical Association. Annual meeting. Carolina Beach, N. Car., June 28-29, 1949. J. H. Brown, Tarboro, N. Car., secretary.

American Veterinary Medical Association. Annual convention. Book-Cadillac and Statler Hotels, Detroit, Mich., July 11-14, 1949. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Chief Livestock Sanitary Officials. National Assembly. The Neil House, Columbus, Ohio, Oct. 10-11, 1949. Dr. C. F. Clark, State Office Building, Lansing 13, Mich., secretary.

United States Livestock Sanitary Association. Annual meeting. The Neil House, Columbus, Ohio, Oct. 12-14, 1949. Dr. R. A. Hendershott, 1 West State St., Trenton 8, N. J., secretary.

• • •

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. George E. Martin, 530 Stockton Ave., San José, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

(Continued on page 24)

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[1]Chavance, J. Vet. Med. 41: (1946) 199-201

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East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

Indiana Tenth District Veterinary Medical Association, the third Tuesday of each month. J. J. Arnold, Box 144, New Castle, Ind.

Jefferson County Veterinary Society, Louisville, Ky., the first Wednesday evening of each month. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. C. L. Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass., secretary-treasurer.

Michiana Veterinary Medical Association, Hotel Elkhart, Elkhart, Ind, the second Thursday of each month, at 7 p.m. Maurice Court, Marcellus, Mich., secretary.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Northern San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. I. N. Bohlender, Box 588, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Redwood Empire Veterinary Medical Association, the second Tuesday of every other month. Charles D. Stafford, Novato, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

(Continued on page 26)

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(*Continued from page 24*)

San Diego County Veterinary Medical Association, the third Tuesday of each month. Mitchell Smith, 3740 Rosecrans Boulevard, San Diego, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. H. I. Ott, 10326 East Artesia Blvd., Bellflower, Calif., secretary.

• • •

Foreign Congresses

Seventh Pacific Science Congress. New Zealand, Feb. 2-22, 1949. Mr. Harold J. Coolidge, 2101 Constitution Ave., Washington 25, D. C., executive secretary.

Fifth International Congress of Comparative Pathology. Istanbul, Turkey, May 17-20, 1949. Dr. Louis Grollet, 7 rue Gustave Naduad, Paris 16 e, France, general secretary of permanent committee.

Fourteenth International Veterinary Congress. London, England, Aug. 8-14, 1949.

General Secretary, Permanent Committee: Prof. L. de Blieck, Kwartellaan 51, The Hague, Netherlands.

General Secretary, Organizing Committee: Mr. W. G. R. Oates, 9 Red Lion Square, London, W. C. 1, England

Secretary, United States Committee: J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill.

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Experienced young veterinarian wishes to purchase small animal or mixed practice in lower Connecticut or lower New York. Licensed both states. Equitable down payment available. Address "Box D 3," c/o Journal of the AVMA.

Graduate of Pennsylvania, licensed in New Jersey and Pennsylvania, will buy, lease, or share small animal or mixed practice. Will consider practice in any state. Give full details. Address "Box D 6," c/o Journal of the AVMA.

Young, experienced, married, graduate of accredited college wishes to purchase or lease with option to buy small animal practice in New York or New Jersey. Address "Box D 8," c/o Journal of the AVMA.

Wanted—Veterinarians

Veterinarians wanted to fill staff positions in New York animal hospital. Address "Box D 1," c/o Journal of the AVMA.

New Jersey licensed veterinarian wanted to take complete charge of practice and small animal hospital. Wonderful opportunity. Address "Box D 7," c/o Journal of the AVMA.

For Sale or Lease—Practices

FOR SALE — Lucrative mixed practice in thickly populated area of southwest Texas. Wonderful location on heavily traveled highway. Price reasonable; includes only real estate, drugs, and equipment. No good will price added. Address "Box C 1," c/o Journal of the AVMA.

FOR SALE—Wonderful opportunity in capital city of Kentucky. Splendid large and small animal practice of thirty years' standing. No competition. Immediate possession. Modern home

(*Continued on page* 30)

WALTER LINDNER, Lindengrus Kennels, Warren, Michigan, has been training dogs for 25 years. He says Friskies keeps his dogs in much better condition than any other dog food he ever used.

DOG MEN AGREE:

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FOR OVER 16 YEARS Friskies has been a favorite with leading dog men—breeders, trainers and veterinarians. They feed and recommend Friskies because they know it is a *complete* dog food, scientifically balanced to provide *all* the elements known to be essential for *total nourishment.*

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"Delicious TASTE"

ALL DOGS—of every breed and every age—love Friskies "meaty" taste and smell. And a Friskies diet provides variety, too—Friskies Cubes to gnaw like a bone, Friskies Meal to eat like hash.

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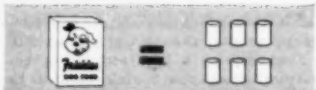

2 lbs. FRISKIES (Dry) Contains 28.8 oz. of nutriments. Less than 10% moisture.

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Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies also should be typed double space and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations. — Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

Anonymous Letters.—Anonymous communications, of whatever nature or purpose, to the JOURNAL or to the Association will not be published or referred for consideration to any Association official or committee.

AMERICAN VETERINARY MEDICAL ASSOCIATION

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Chicago 5, Illinois

(Continued from page 28)

and small animal hospital and boarding kennels are connected and located on main highway through state. Pictures and further information on request. Death of practitioner only reason for selling. Write or phone Mrs. Arthur J. Kay, Frankfort, Kentucky.

FOR SALE—Thriving practice in Rhode Island, 85 per cent small animal. Includes 7-room house, hospital and garage adjoining, 2/3rd acre of land on state highway. Center of thickly populated, rapidly growing suburban section. Equipment, instruments, and drugs included. Opportunity and room for expansion. Owner has opportunity nearer his home and would like to make the switch. $20,000 for everything; $10,000 cash to handle. Address Dr. William C. Todd, Jr., 581 Metacom Avenue, Warren, Rhode Island.

FOR SALE—Dairy and small animal practice for price of modern 6-room home and attached 2-room office with basement kennels. Address C. Ardueser, Realtor, 806 Broadway, Highland, Illinois.

FOR SALE—Small animal hospital and practice on Pacific coast in British Columbia. Fully equipped and grossing $2,100 monthly. Terms. Tremendous opportunity. Address Box D 1," c/o Journal of the AVMA.

One of the largest general practices for sale or rent at once. Old age and illness reason for disposal. Large modern duplex, with oil furnace. Some money down; balance easy payments. Address Dr. John Bjorge, Wautoma, Wisconsin.

FOR SALE — General practice established thirty years. Town of 25,000 in eastern Iowa. Excellent cattle and swine territory. Plenty of small animal practice. Priced reasonable. Address "Box D 4," c/o Journal of the AVMA.

FOR SALE—Active and thriving mixed practice in central Minnesota in county seat town of 3,500. Office and home for sale. Also full line of drugs and equipment. Must sell because of illness. Address "Box D 10," c/o Journal of the AVMA.

FOR SALE—Excellent large animal and poultry practice; one-half swine. In rich livestock area in southwestern Minnesota. Must sell immediately. New house optional. Address "Box D 11," c/o Journal of the AVMA.

Books and Magazines

Hospital bldg. problems? Rev. 4th ed. Judy's Kennel Bldg. & Plans, $3. Many suggestions, layouts, much data. Keep up on dogs—Dog World $3 yr., 2 yrs., $5. Judy Publishing Co., 3323 Michigan Blvd., Chicago 16.

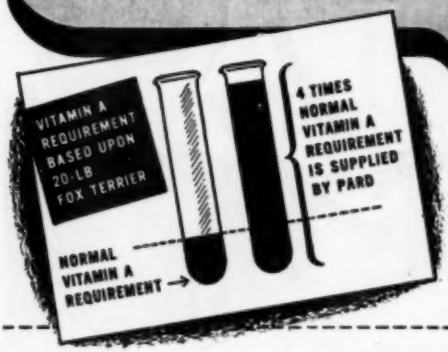
For Sale—Artificial Insemination Supplies

ARTIFICIAL INSEMINATION INSTRUMENTS —Essential equipment, replacement parts and materials, designed and manufactured especially for artificial insemination. Prompt delivery. New catalog. Address: Breeder's Equipment Co., Flourtown, Pa.

The Field in Which We Labor.—The Hon. Clinton P. Anderson, former secretary of agriculture and senator-elect of New Mexico, writing in *General Magazine and Historical Chronicle*, fifty-year-old quarterly of the University of Pennsylvania, says:

"The American farmer owns $60,000,000,000 worth of real estate, $12,000,000,000 worth of livestock, and $7,000,000,000 worth of machinery; he has $15,000,000,000 deposited in banks and owns $5,000,000,000 in government bonds. This is the farmer that in 1932 and 1933 was in bad shape."

Actual tests show Pard supplies many times the Vitamin A requirements for dogs and optimum Vitamin D


VITAMIN A REQUIREMENT BASED UPON 20-LB FOX TERRIER
4 TIMES NORMAL VITAMIN A REQUIREMENT IS SUPPLIED BY PARD
NORMAL VITAMIN A REQUIREMENT

The chart on the left shows the amount of Vitamin A required to maintain optimum dog health in a 20-lb. Wire-Haired Fox Terrier. It demonstrates the abundancy of A in Pard, which also contains the Vitamin D in required proportions.

VITAMIN A CONTENT OF PARD

Based on the requirements of a 20-lb. Wire-Haired Fox Terrier.

VITAMIN A—Pard supplied up to 4 times the normal requirement.

VITAMIN D—Pard supplied this important vitamin in optimum amounts.

Vitamin A is essential in the diet for normal vitality of epithelial cells and also aids greatly in maintaining resistance to infections. It is also of value in the maintenance of normal eye functions and mucous membranes.

Vitamin D plays an important part in helping to regulate metabolism of calcium and phosphorus for use in bone and tooth structure and normal growth.

Laboratory Kennel studies are just another step by Swift & Company to assure dogs better health through better foods. Careful quality-supervision is maintained in its manufacture to guarantee uniformity in nutrient content, taste, color, odor and texture. Pard is an easy-to-feed nourishing food that dogs love from the very first sniff.

The Pard formula is rich and appetizing and includes wholesome foods dogs need . . . a well-balanced formula, rigidly adhered to and nutritionally excellent. Pard contains every known essential for good nutritional health.

Recommend The One Dog Food Made With

LEAN, RED MEAT*

Plus All Known Dog-Health Vitamins

*NO WONDER dogs thrive on Ken-L-Ration! It's the only ONE of America's five leading dog foods made with lean, red meat—wholesome, nutritious U. S. Government inspected horse meat. Dog owners welcome the recommendation of Ken-L-Ration because it's the money-saving way to feed dogs the meat they need and crave. It costs far less than butcher meat.

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This famous canned dog food helps develop clear, bright eyes . . . a thick, glossy coat . . . strong teeth . . . sturdy bones. It also helps promote a happy, playful disposition.

SUPERCHARGED WITH VITAMINS

Here's another reason dogs thrive on Ken-L-Ration: it contains all known "dog-health" vitamins—plus essential minerals. Dogs love it, too. Recommend Ken-L-Ration and, like thousands of veterinarians, you will see that it is a sound way to win confidence of dog owners.

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PROMPT CONTROL OF { **PNEUMONIA** / **HEMORRHAGIC SEPTICEMIA** / **FOOT ROT**

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Prompt control of acute bacterial infections such as pneumonia, hemorrhagic septicemia (shipping fever), foot rot in cattle and septicemias is accomplished by parenteral administration of MERAMETH Sterile Solution, a combination of sodium sulfamerazine 5% and sodium sulfamethazine 5%.

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This new, highly effective sulfonamide combination provides the following advantages:

1. Prompt therapeutic blood levels after parenteral administration.
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New Building to be used for Research.—The acquisition of a partially constructed 24,000-sq.-ft. building in Columbus, Neb., has been announced by Becton, Dickinson & Co. Completion of this building is scheduled for March 1, 1949. It is to be used for experimental operations which will begin on or about March 15, 1949.

Joseph Warren, martyr of Bunker Hill and a graduate of Harvard University in 1759, was a Boston physician.

WHITE'S ANIMAL CASTRATION

Now ready for sale, a new enlarged text-book for TEACHERS, STUDENTS and PRACTITIONERS, written and published by George Ransom White, M.D., D.V.M.

This book contains 292 pages and 254 illustrations. Each and every operation is illustrated and described. The book is authoritative and instructive. It sponsors the latest, safest and most satisfactory methods of unsexing domesticated animals.

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Addition of vitamin K to the diet of pregnant bitches helps to produce a more uniform, stronger litter.—*Dr. F. R. Booth, Elkhart, Ind.*

Representative Sadlak of Connecticut introduced a bill in the 80th Congress that would authorize the issuance of a special postage stamp in honor of the American chicken.

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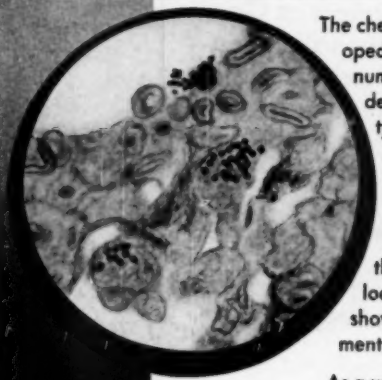

The chemotherapy of bacterial infections has developed in rapid strides. There are now available a number of sulfonamide compounds which have demonstrated antibacterial action in various types of infection and in this field is Sulfathiazole (2-sulfanilamidothiazole).

Extensive clinical observations reported in the leading veterinary journals have confirmed the experimental evidence that Sulfathiazole exerts a destructive action on staphylococci in animals. In addition, it has been shown that Sulfathiazole has merit in the treatment of infectious coryza in chickens.

As a wound dressing, Sulfathiazole is highly useful locally and in compound fractures. It has also been applied in the form of an ointment with good results.

Write for booklet which contains detailed information on indications, dosage, manner of use and side effects.

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How Supplied: Sulfathiazole is supplied in tablets of 0.5 Gm. (7.72 grains), bottles of 50, 500 and 1000. Also in tablets of 0.25 Gm. (3.86 grains), bottles of 100, 500 and 1000, and in tablets of 2 Gm. (30 grains), bottles of 100 and 250. In powder in bottles of 5 Gm. and 1 lb. Also supplied as Sulfathiazole Eye Ointment 5%, ⅛ oz. tubes, and Sulfathiazole Ointment 5% in 1 oz. tubes and 1 and 5 lb. jars. Sulfathiazole Sodium is supplied in tablets of 0.25 Gm., bottles of 50; sterile powder, ampuls of 1 Gm., boxes of 10 and 100; also bottles of 5 Gm.

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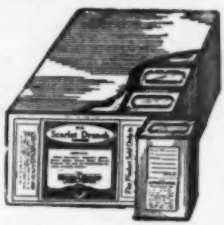

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Caprine brains and cords are not only processed through new homoloid triturators but also by high speed centrifugalization. Thus the finished vaccine emulsion is so finely ground that it flows readily through needles as fine as 22 gauge.

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In addition to the multiple mouse test of Habel, all serial lots are tested for non-virulency on rabbits and mice, bacteriologically tested for sterility, and on ten or more live dogs for safety.

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